MODULE 3

MANAGEMENT OF CONTAINERS

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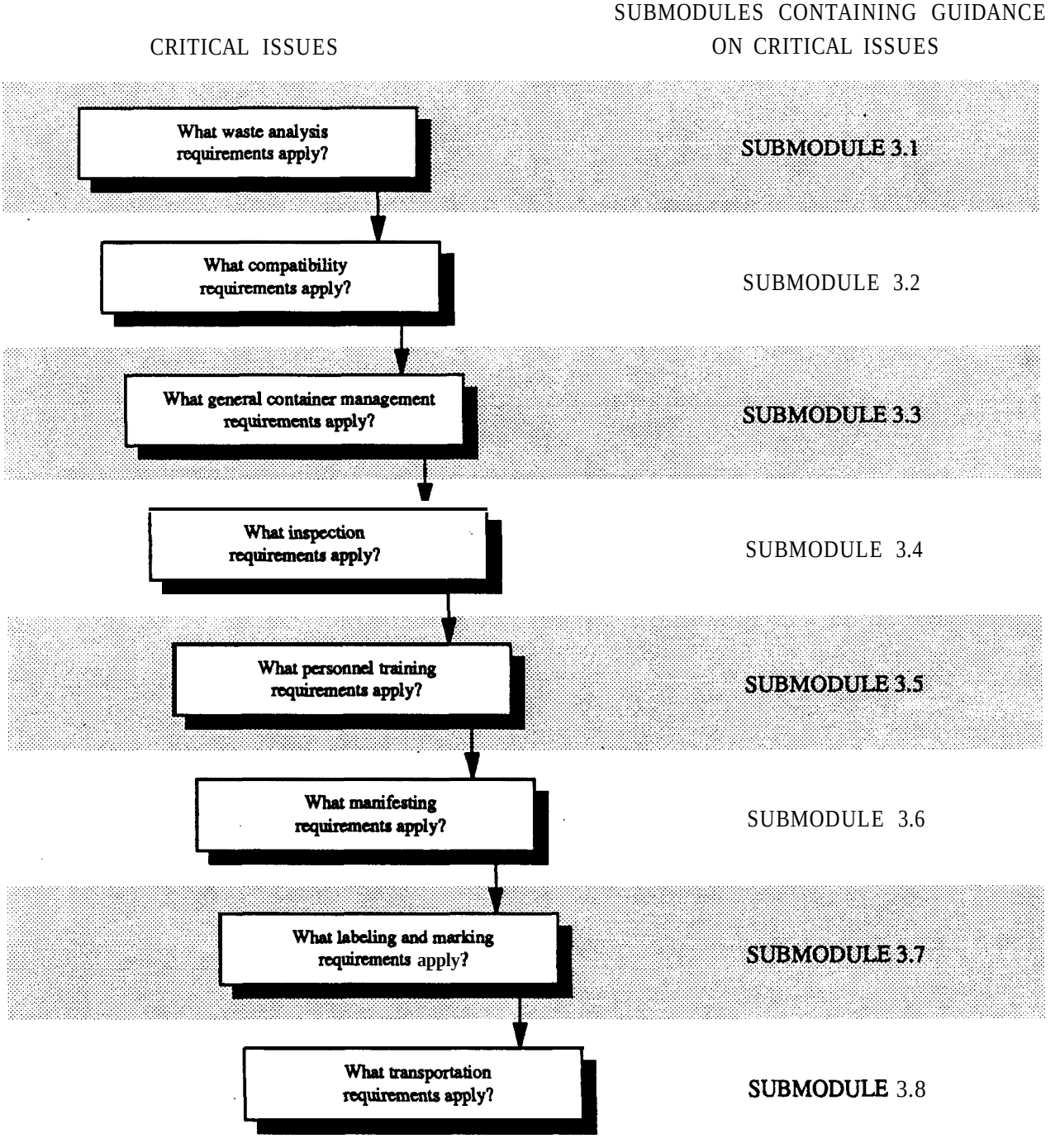
Introduction to Module 3:

This module describes the diverse requirements that apply to the management of containers at a container storage areas. Waste management and environmental oversight personnel should use this module to:

- determine when and what waste analysis requirements apply to container storage areas and identify technical guidance manuals to assist waste management personnel in conducting such analyses;
- ensure that hazardous and radioactive mixed wastes stored in containers are compatible with other wastes and with the containers themselves;
- identify proper procedures for handling, moving, opening, or otherwise managing the containers in such a way as to comply with RCRA and other related requirements, and ensure that waste management personnel are protected from any hazards associated with handling the containers;
- properly inspect containers and the container storage area;
- establish an acceptable personnel training program;
- comply with the RCRA manifesting requirements regardless of whether the container storage area is shipping or receiving wastes;
- comply with accumulation and pre-transport labeling and marking requirements; and
- identify the RCRA and DOT transportation requirements applicable to container storage areas, and ensure that hazardous and radioactive mixed wastes are properly documented, marked and labeled, loaded, secured, and transported.

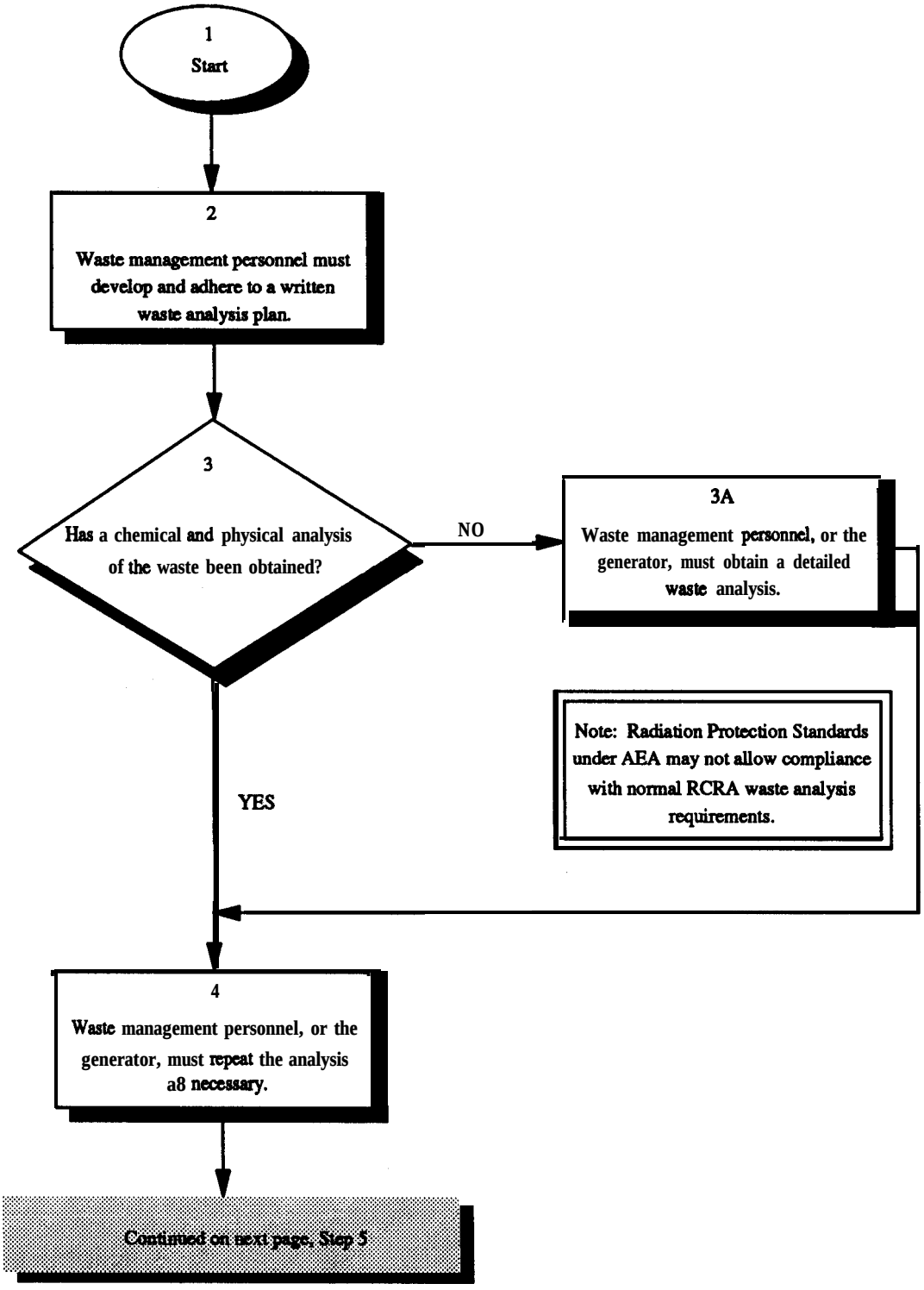
The following flowchart and accompanying narrative discussion guides you step-by-step through the applicable requirements for container storage areas.

OVERVIEW OF MODULE 3: MANAGEMENT OF CONTAINERS



Module 3: Flowchart

SUBMODULE 3.1: WASTE ANALYSIS



SUBMODULE 3.1 WASTE ANALYSIS

Step 1 Start.

Step 2 Waste management personnel must develop and follow a written waste analysis plan. The plan must be kept at the facility and must specify the parameters for which each hazardous waste will be analyzed, the test methods and sampling methods to be used, and the frequency for conducting analyses (40 CFR 264.13 and 265.13). The waste analysis plan must specify procedures to identify potentially ignitable, reactive, or incompatible wastes (see Submodule 3.2, "Compatibility," for a discussion of compatibility requirements at container storage areas). Specifically, the plan must include procedures for determining the following: the compatibility of a waste to a container; of a waste to other wastes stored nearby; and of a waste to wastes previously held in reused containers. The plan must also establish procedures for analyzing ignitable/reactive containerized wastes and analyzing liquids that are collected in a storage area. Waste management personnel should consult Appendix V of 40 CFR Part 264 for groupings of wastes that cannot be stored in the same container. Finally, for each hazardous waste stream placed in a container exempted from using air emission controls because the waste [at the point of waste origination or at the point of waste treatment (for treated hazardous waste)] is below the 500 ppmw average VO concentration threshold, the plan may need to describe 40 CFR 264/265 ***Subpart CC waste determination procedures***. These procedures address collecting representative samples such that a minimum loss of organics occurs throughout the sample collection and handling process, and ensure sample integrity is maintained. For more detail on sampling procedures and waste analysis methods, waste management personnel should consult the references at the end of this submodule.

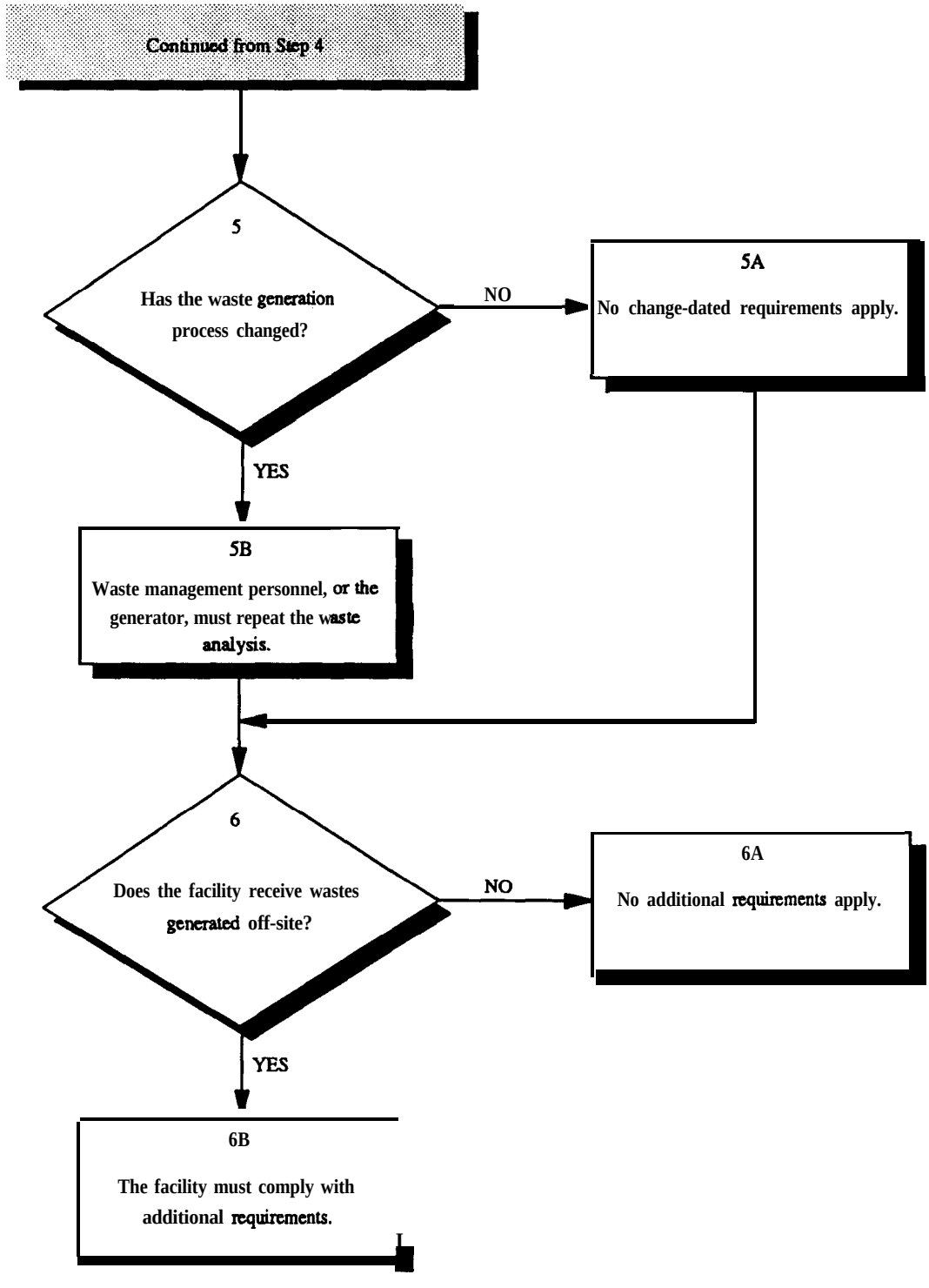
It also is acceptable for the waste analysis plan to require the generator of the waste to complete a detailed chemical and physical analysis of a representative sample of the waste prior to waste management personnel accepting the waste in to container storage. However, if the generator does not supply the requisite information, and DOE accepts the waste, waste management personnel operating the container storage areas are responsible for obtaining or developing the waste analysis information.

NOTE: Approved waste analysis proceduresfor certain radioactive mixed waste have not yet been developed. Also, for some of DOE's radioactive mixed waste streams, compliance with the normal RCRA waste analysis requirements could result in radiological exposures to workers that exceed applicable AEA occupational exposure standards found in DOE Order 5480.11. In such cases, DOE field offices should seek agreement with EPA or a State on an alternative requirement (pursuant to RCRA Section 1006(a), which defers to the AEA in the event of inconsistent requirements). Such an alternative may involve using remote sensing, a smaller sample size, or process knowledge to determine waste composition.

Step 3 Before treating, storing, or disposing of hazardous waste, waste management personnel, or the generator if specified in the written waste analysis plan, must obtain a detailed chemical and physical analysis of a representative sample of the waste.

Step 3A The analysis may include: data developed under 40 CFR Part 261 to determine if a waste is defined as hazardous; existing published data on the waste; or data on waste generated from similar processes.

Step 4 The analysis must be repeated as necessary to ensure that the information is accurate and up to date.


Continued from Step 4
5
Has the waste generation process changed?
NO
5A
No change-dated requirements apply.
YES
5B
Waste management personnel, or the generator, must repeat the waste analysis.
6
Does the facility receive wastes generated off-site?
NO
6A
No additional requirements apply.
YES
6B
The facility must comply with additional requirements.

Step 5 Waste management personnel, or the generator as appropriate, must determine whether the waste generation process has changed in a manner that could potentially affect waste composition.

Step 5A If the process has not changed, waste management personnel or the generator must continue to conduct waste analyses as necessary, as determined in Step 3 and 4.

Step 5B The waste analysis must be repeated if a change in the waste generation process occurs that could potentially affect waste composition.

Step 6 The facility must comply with additional chemical and physical waste analysis requirements (40 CFR 264.13(a)(4)) if it receives hazardous waste from off-site (i.e., waste that was generated elsewhere).

Step 6A If no waste is received from off-site, no further requirements apply.

Step 6B If, upon receipt of hazardous waste at a container storage area from an off-site generator, the mandatory analysis of the waste received reveals that waste does not correspond with information on the manifest or shipping papers, then the waste analysis must be repeated. See the discussion in Submodule 3.6, "Manifesting," on manifesting discrepancies for further requirements when a discrepancy is detected.

REFERENCES FOR SUBMODULE 3.1

1) *Radioactive Waste Management,* U.S. Department of Energy, DOE 5820.2A, September 26, 1988.

2) *Test Methods for Evaluating Solid Waste, Volume II,* U.S. Environmental Protection Agency, Office of Solid Waste, SW-846, November 1986.

3) Preparing a Waste Analysis Plan for RCRA Treatment, Storage, and Disposal Facilities: A Guidance Manual, U.S. Department of Energy, Office of Environmental Guidance, RCRA/CERCLA Division, EH-231, (forthcoming).

4) *RCRA Subpart CC Organic Air Emission Emission Standards: Waste Determination; DOE/EH-413-9807* U.S. Department of Energy, Office of Environment, Safety, and Health, RCRA/CERCLA Division, March 1998.

5) 4) 40 CFR 264.13 -- General waste analysis.

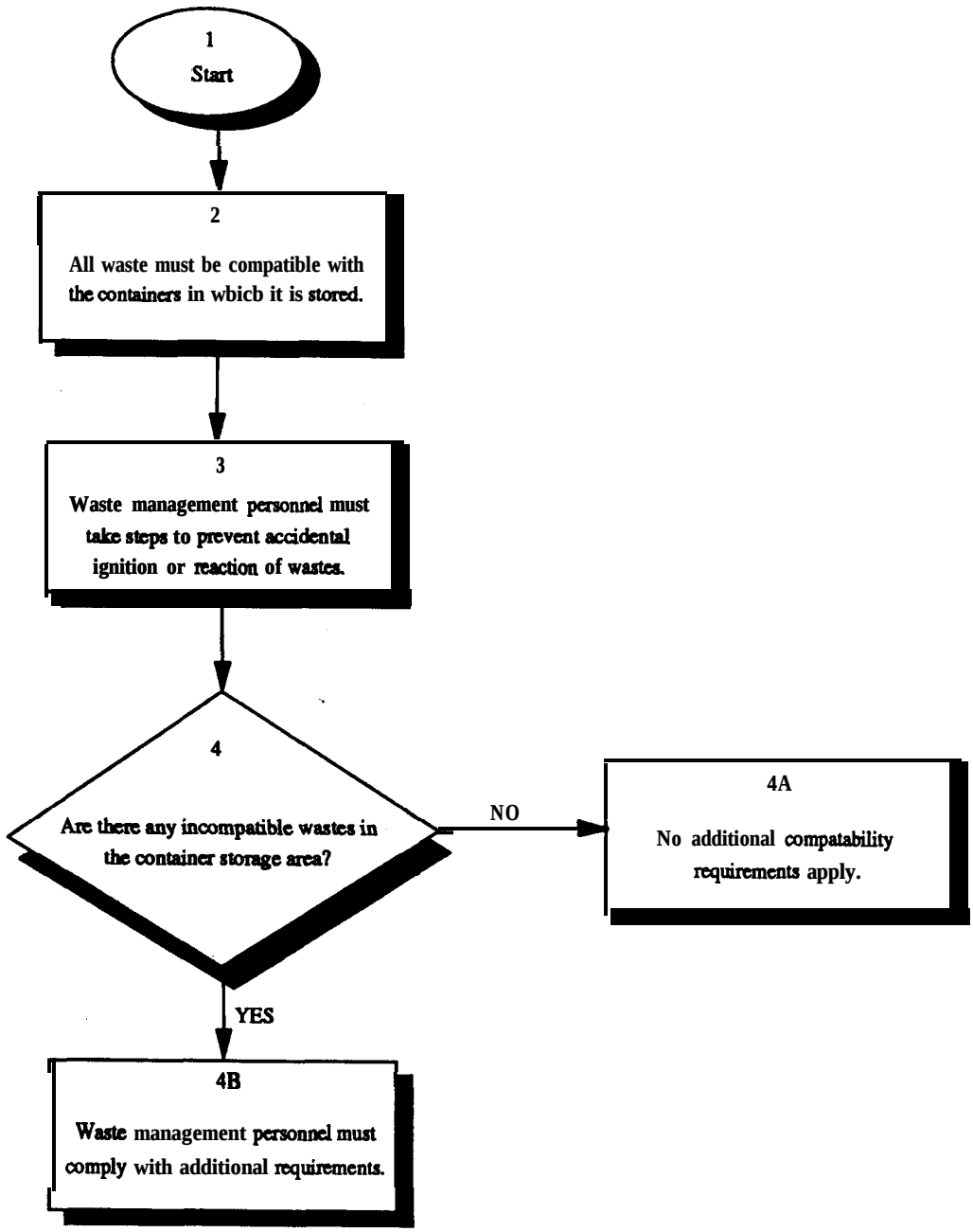
6) 40 CFR 264.17 -- General requirements for ignitable, reactive, or incompatible wastes.

7) 40 CFR 264.73 -- Operating record.

8) 40 CFR 264.1083 -- Waste determination procedures

Module 3: Flowchart

SUBMODULE 3.2: **COMPATIBILITY**



SUBMODULE 3.2 COMPATIBILITY

Step 1 Start.

Step 2 Materials must be compatible with the containers in which they are stored. For a material to be compatible with its container, it must not cause corrosion or decay of containment materials (40 CFR 261.22). To recognize different types of corrosion and factors influencing corrosion, such as temperature, pH, and oxidizing agents, waste management personnel should consult: *Compatibility of Wastes in Hazardous Waste Management Facilities*, U.S. Environmental Protection Agency, Office of Solid Waste, 1982. The document also provides methods for evaluating and selecting structural material (e.g., 304 stainless steel) and lining material as well as a compatibility chart for chemicals versus different structural materials.

Step 3 Waste management personnel must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste at container storage areas. These wastes must be handled so as to prevent damage to the structural integrity of a device or the facility or otherwise threaten human health or the environment. Containers holding ignitable or reactive waste must be located at least 50 feet (15 meters) from the facility property line (i.e., not the boundary of the container storage area). Waste management personnel should take precautions to prevent accidental ignition or reaction of these wastes by separating and protecting them from open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks, spontaneous ignition, and radiant heat. National Fire Protection Association (NFPA) standards for flammable and combustible materials should be applied when storing ignitable or reactive waste. (See Submodule 4.3, "Spill Response," for a discussion of contingency plans and emergency procedures for hazardous waste management facilities.)

Step 4 Incompatible wastes, if brought together, could result in heat generation, toxic gas generation, and/or explosions. Waste management personnel must therefore determine if any incompatible wastes exist at the container storage area.[1]

Step 4A If all wastes at the facility are compatible, then no further requirements apply.

Step 4B Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material. Further, a storage container holding waste that is incompatible with any waste or materials stored near other containers must be separated from the other materials by a dike, berm, wall, or other device.

[1] Incompatible wastes stored in containers must not, upon ultimate disposal, be placed in the same landfill cell, unless measures are taken (e.g., walls, berms, etc.) to prevent uncontrolled commingling of the waste (40 CFR 265.313).

REFERENCES FOR SUBMODULE 3.2

1) *A Method for Determining the Compatibility of Hazardous Wastes*, U.S. Environmental Protection Agency, EPA-600/2-80-076, 1980.

2) *Compatibility of Wastes in Hazardous Waste Management Facilities*, U.S. Environmental Protection Agency, Office of Solid Waste, November 1982.

3) *Waste Analysis Plans*, U.S. Environmental Protection Agency, Office of Solid Waste, EPA/530-SW-84-012, October 1984.

4) 40 CFR 264.17 -- General requirements for ignitable, reactive, or incompatible wastes.

5) 40 CFR 264.172 -- Compatibility of waste with containers.

6) 40 CFR 264.177 -- Special requirements for incompatible wastes.

7) Ignitable and Combustible Liquid Code, Fire Protection Association, NFPA 30.

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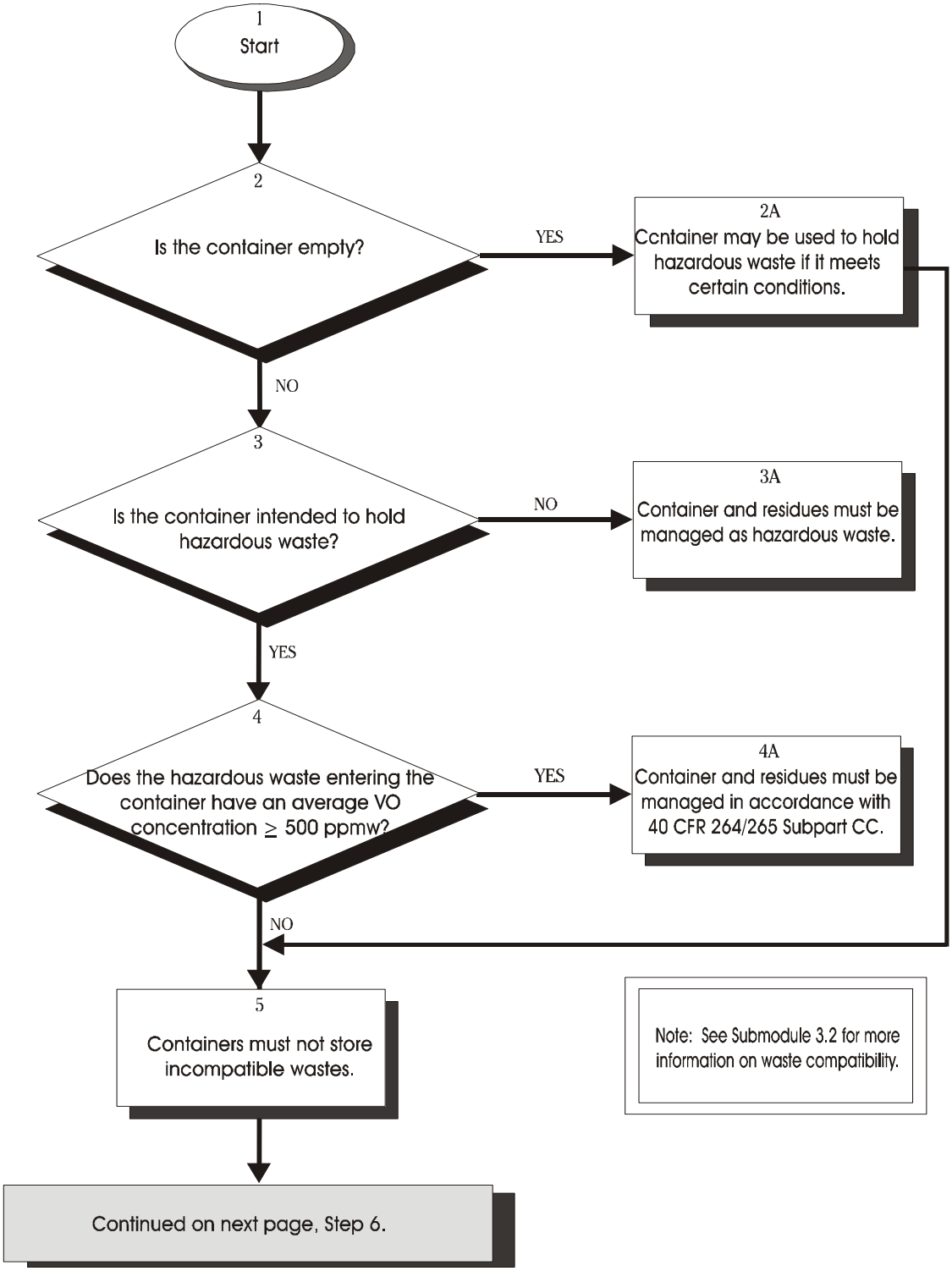
Module 3: Flowchart

SUBMODULE 3.3 GENERAL CONTAINER MANAGEMENT PRACTICES



SUBMODULE 3.3 GENERAL CONTAINER MANAGEMENT PRACTICES

Step 1 Start.

Step 2 For a discussion of what constitutes an empty container, see Module 1, "Applicability."

Step 2A Empty containers, subject to the conditions outlined below, may be used to store hazardous or radioactive mixed wastes. Reuse of containers in transporting hazardous and radioactive mixed waste is governed by DOT regulations, in particular 49 CFR 173.28.

Step 3 Regardless of whether the containers are intended to store hazardous or radioactive mixed waste, waste management personnel must comply with restrictions on the use of containers that are not empty.

Step 3A The containers and all residues must be managed as hazardous waste in accordance with all applicable requirements of 40 CFR 262 through 266, unless waste management personnel can demonstrate that the container and residues are not hazardous. For information on how such demonstrations can be made (e.g., triple rinsing of containers), see 40 CFR 261.7.

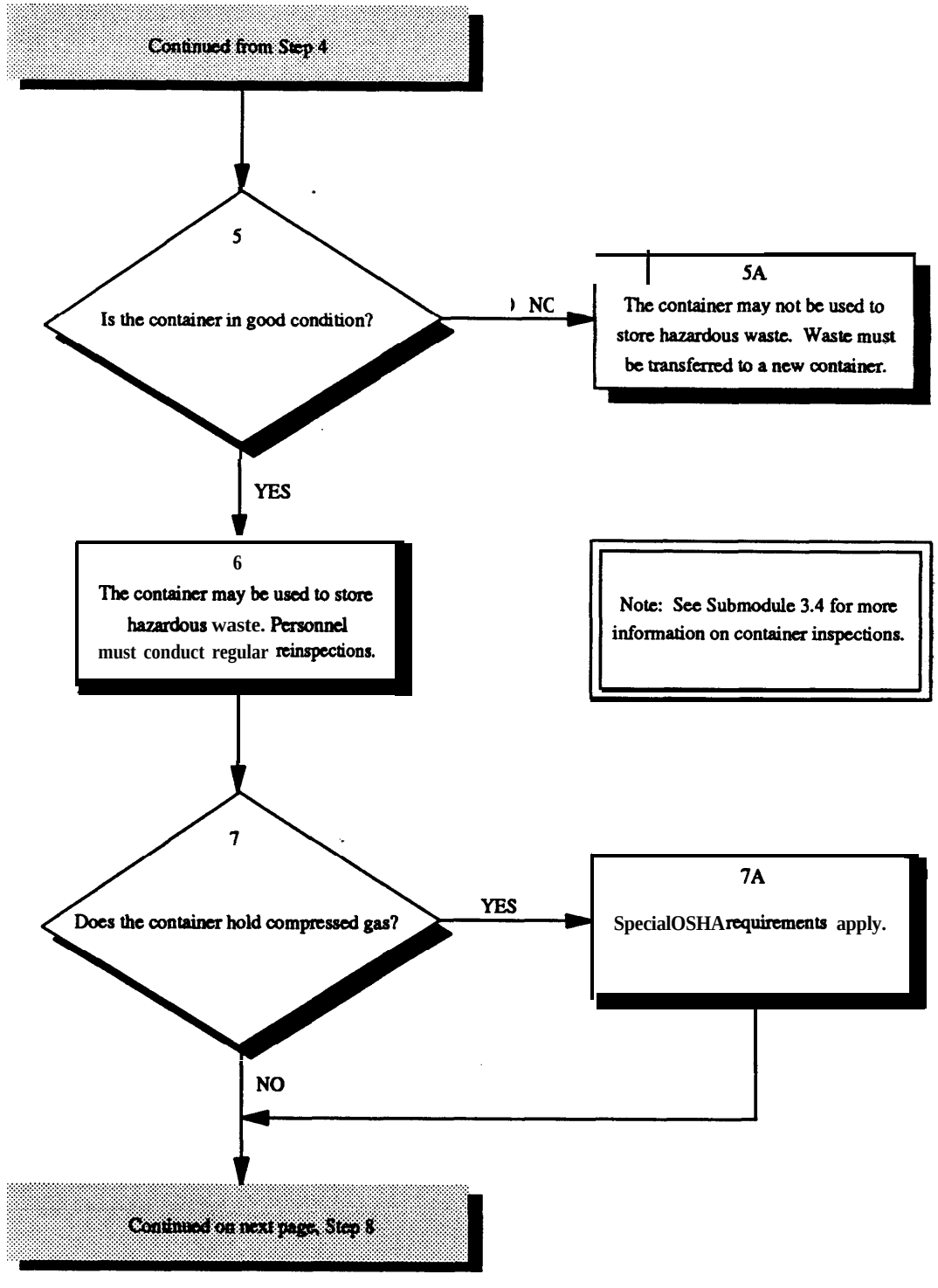
Step 4 Waste management personnel must determine whether any of the containers in their area(s) are managing hazardous waste that, at the point of waste origination, has an average VO concentration greater than or equal to 500 ppmw.

Step 4A ***Subpart CC container operating requirements*** are organized into three levels (Levels 1, 2, and 3) based on container design capacity, total organic content of the waste, and use of the container. They are found in 40 CFR 264.1086 (for permitted facilities) and 40 CFR 265.1087 (for interim status facilities and 90-day generators). Whenever hazardous waste exceeding the 500 ppmw threshold enters a container, waste management personnel must install all covers and closure devices, as applicable, and secure and maintain each closure device in the closed position except as follows:

- Opening of the closure device is allowed for filling or removing waste (i.e., sampling, waste transfers) and to perform routine activities (i.e., measure depth of waste) but must be reclosed immediately after the process or activity ceases.
- Opening of vacuum relief valves, conservation vents, or pressure relief devices is allowed for maintaining internal pressure. The valve, vent or device must be designed and operated with no detectable organic emissions when in the closed position.
- Opening of a safety device to avoid an unsafe condition is allowed.

Container Level 2 operating standards include an additional requirement that waste transfers must minimize exposure of the hazardous waste to the atmosphere using one of several methods (e.g., a submerged-fill method to load liquids; a vapor-balancing or vapor-recovery system to collect and control the displaced vapors; and purging the transfer line fitted through an opening in the top of a container prior to removing it from the container). Container Level 3 operating specifications rely on equipment design and operating criteria for closed-vent systems and contol devices.

Step 5 When reusing containers, hazardous or radioactive mixed wastes must not be stored that are incompatible with either the container, or the remaining waste residues, if any are present. See Submodule 3.2, "Compatibility," for a discussion of compatibility.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5
Is the container in good condition?
NO
5A
The container may not be used to store hazardous waste. Waste must be transferred to a new container.
YES
6
The container may be used to store hazardous waste. Personnel must conduct regular reinspections.
Note: See Submodule 3.4 for more information on container inspections.
7
Does the container hold compressed gas?
YES
7A
SpecialOSHArequirements apply.
NO
Continued on next page, Step 8

Step 5 Containers must be in excellent condition and handled and stored so as to prevent leakage or mixing from occurring to the maximum extent possible. A container must not be opened, handled, or stored in a manner which may rupture it or cause it to leak.

Step 5A Damaged, ruptured, leaking, or otherwise deteriorating containers may not be used to store hazardous or radioactive mixed waste. The waste must be transferred to a structurally sound container and the old container and any residues must be managed as hazardous waste, unless it can be demonstrated that the old container and residues are not hazardous. Salvage containers and proper absorbent must be available for spills, leaks, or ruptures. A spill containment program must be implemented where major spills occur from the transfer of materials. Drums and containers that cannot be moved without rupture, leakage, or spillage must be emptied into a sound container.

Step 6 When practical, drums and containers must be visually inspected to ensure their integrity prior to being moved (e.g., signs of deterioration or signs that the drum is under pressure such as swelling). Drums or containers that cannot be inspected before being moved because of storage conditions must be moved to an accessible location and inspected prior to further handling. Site operations must be organized to minimize container movement.

NOTE: See Submodule 3.4, "Inspections," for more information on container inspections.

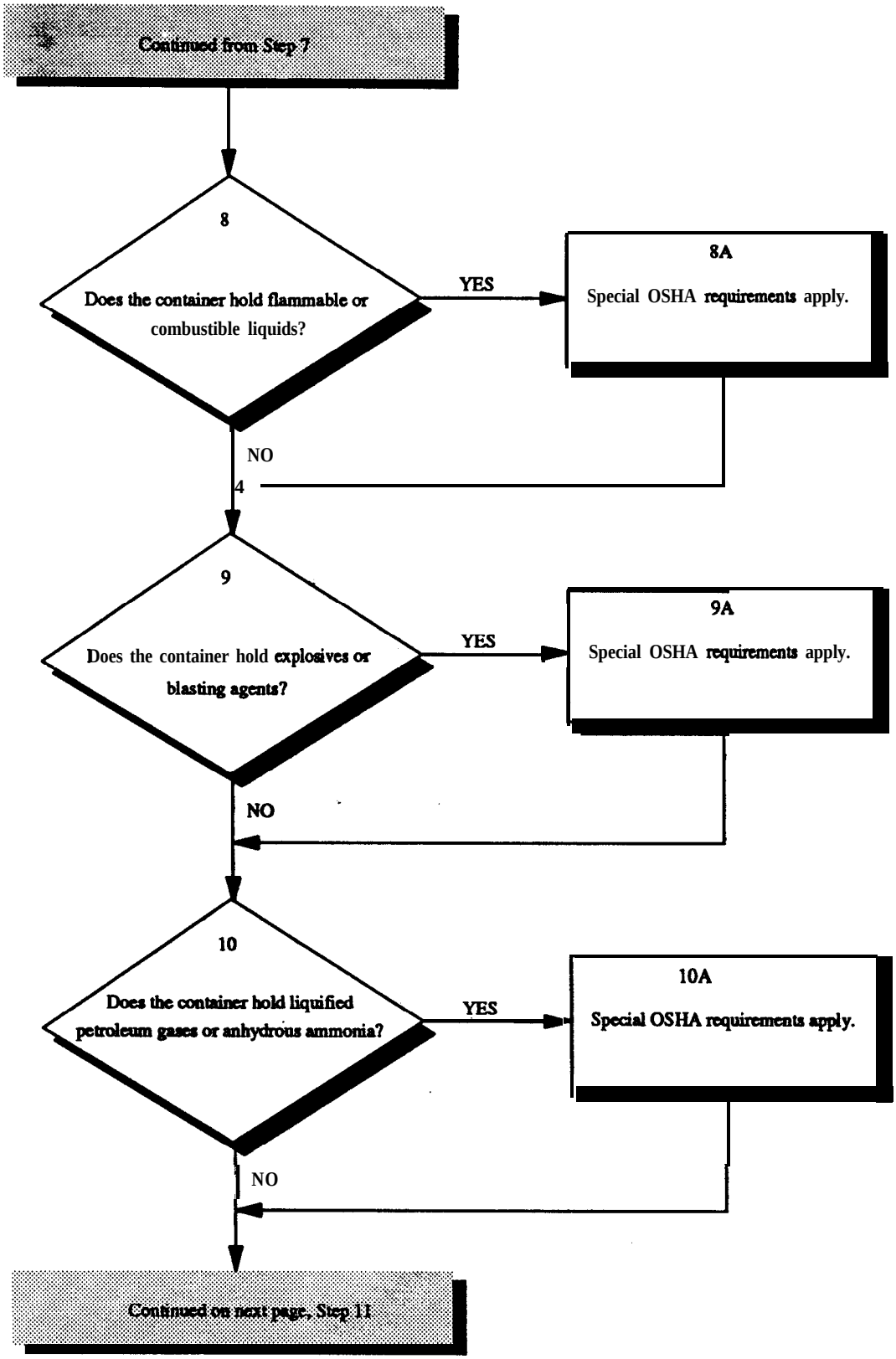
Several types of equipment can be used to move drums, including: a drum grappler attached to a hydraulic excavator; a roller conveyor equipped with solid rollers; and drum carts designed specifically for drum handling, for example. The drum grappler is the preferred piece of equipment for drum handling. To ensure safety during drum handling and movement, workers should be trained in proper lifting and moving techniques, vehicles should contain a sufficient rated load capacity to handle anticipated loads, and operators should have a clear view when moving drums.

If signs of excess interior pressure are evident, waste management personnel should attempt to relieve the pressure safely. If a container storing radioactive mixed waste must be opened to relieve pressure, precautions must be taken to ensure that waste management personnel are not exposed to radiation in excess of limits specified in DOE Order 5480.11, *Radiation Protection for Occupational Workers*. Shielding between the employee and the containers may be necessary, if pressure cannot be relieved from a remote location. Waste management personnel must not stand on, nor work from drums or containers. Containers holding hazardous waste must always be closed during storage, except when adding or removing waste. When opening containers, workers must be careful not to rupture or otherwise damage the containers.

Step 7 Containers holding certain types of compressed gases are subject to special OSHA requirements listed in Step 7A in addition to those specified under RCRA.

Step 7A Waste management personnel should consult the following sections of 29 CFR for OSHA requirements applicable to compressed gases:

- general OSHA requirements for gases -- 29 CFR 1910.101;
- OSHA requirements for acetylene -- 29 CFR 1910.102;
- OSHA requirements for hydrogen -- 29 CFR 1910.103;
- OSHA requirements for oxygen -- 29 CFR 1910.104; and
- OSHA requirements for nitrous oxide -- 29 CFR 1910.105.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8
Does the container hold flammable or combustible liquids?
YES
8A
Special OSHA requirements apply.
NO
4
9
Does the container hold explosives or blasting agents?
YES
9A
Special OSHA requirements apply.
NO
10
Does the container hold liquified petroleum gases or anhydrous ammonia?
YES
10A
Special OSHA requirements apply.
NO
Continued on next page, Step 11

Step 8 OSHA regulations define "flammable liquid" as any liquid having a flashpoint below 100°F and a "combustible liquid" as any liquid having a flashpoint at or above 100°F with an upper flashpoint limit of 200°F (29 CFR 1910.106(a)(18) & (a)(19)).

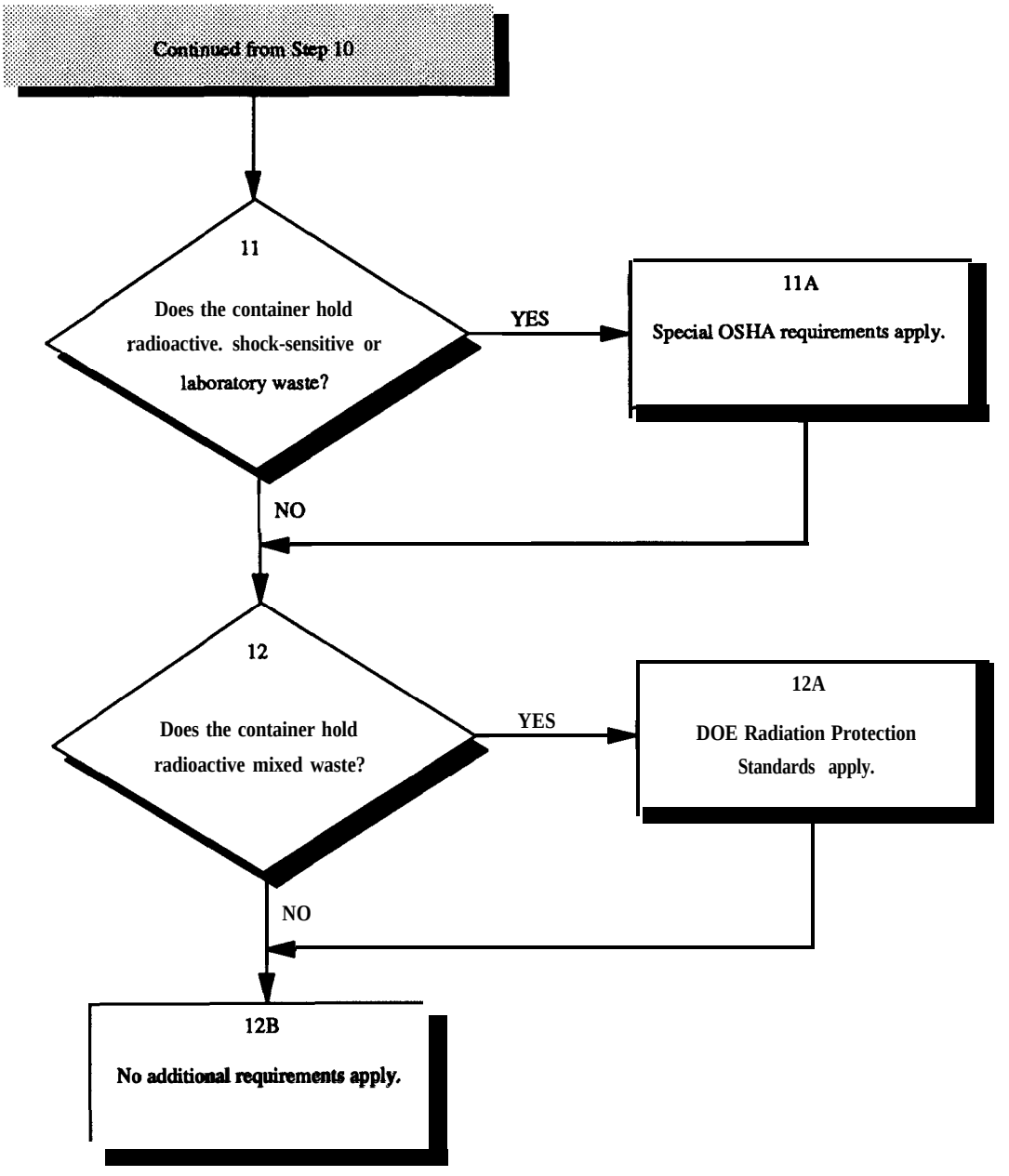
Step 8A Waste management personnel should consult 29 CFR 1910.106 for OSHA requirements applicable to flammable and combustible liquids.

Step 9 OSHA regulations define "explosive" as any chemical compound, mixture or device, the purpose of which is to function by explosion (29 CFR 1910.109(a)(3)). A "blasting agent" is defined as any material or mixture, consisting of a fuel and an oxidizer, intended for blasting, not otherwise classified as an explosive, and in which none of the ingredients are classified as explosives, provided that the finished product cannot be detonated by a No. 8 test blasting cap when unconfined (29 CFR 1910.109(a)(1)).

Step 9A Waste management personnel should consult 29 CFR 1910.109 for OSHA requirements applicable to explosives and blasting agents.

Step 10 OSHA regulations define "liquid petroleum gases" as any material which is composed predominantly of the following hydrocarbons or mixtures thereof: propane, propylene, butane, and butylene (29 CFR 1910.110(a)(7)). Special OSHA requirements also apply to anhydrous ammonia.

Step 10A Waste management personnel should consult 29 CFR 1910.110 for OSHA requirements applicable to liquid petroleum and 29 CFR 1910.111 for anhydrous ammonia requirements.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11
Does the container hold radioactive. shock-sensitive or laboratory waste?
YES
11A
Special OSHA requirements apply.
NO
12
Does the container hold radioactive mixed waste?
YES
12A
DOE Radiation Protection Standards apply.
NO
12B
No additional requirements apply.

Step 11 Special requirements apply for radioactive, shock-sensitive, and laboratory waste. Shock-sensitive wastes are wastes that may react violently (i.e., explode) when jarred. Laboratory wastes do not necessarily originate from a laboratory, but rather consist of containers holding smaller individual containers of hazardous waste.

Step 11A Waste management personnel should consult 29 CFR 1910.120(j) for special OSHA requirements applicable to radioactive, shock sensitive, and laboratory wastes.

Step 12 Waste management personnel must determine whether any of the containers in the container storage area contain radioactive mixed waste.

Step 12A If the containers hold radioactive mixed waste, waste management personnel must not be exposed to radiation in excess of radiation protection standards specified in DOE Order 5480.11 Radiation Protection for Occupational Workers.

Step 12B No further general container management practices apply.

REFERENCES FOR SUBMODULE 3.3

1) *Hazardous and Radioactive Mixed Waste Program*, U.S. Department of Energy, DOE 5400.3, February 22, 1989.

2) *Radioactive Waste Management*, U.S. Department of Energy, DOE 5820.2A, September 26, 1988.

3) *RCRA Subpart CC Organic Air Emission Standards: Containers*, DOE/EH-413/9801, U.S. Department of Energy, Office of Environment, Safety, and Health, RCRA/CERCLA Division, RCRA Information Brief, March 1998.

4) 40 CFR 264 Subpart B -- General facility standards.

5) 40 CFR 264 Subpart C -- Preparedness and prevention.

6) 40 CFR 264 Subpart D -- Contingency plan and emergency procedures.

7) 40 CFR 264.171 -- Condition of containers.

8) 40 CFR 264.173 -- Management of containers.

9) 40 CFR 264.176 -- Special requirements for ignitable or reactive waste.

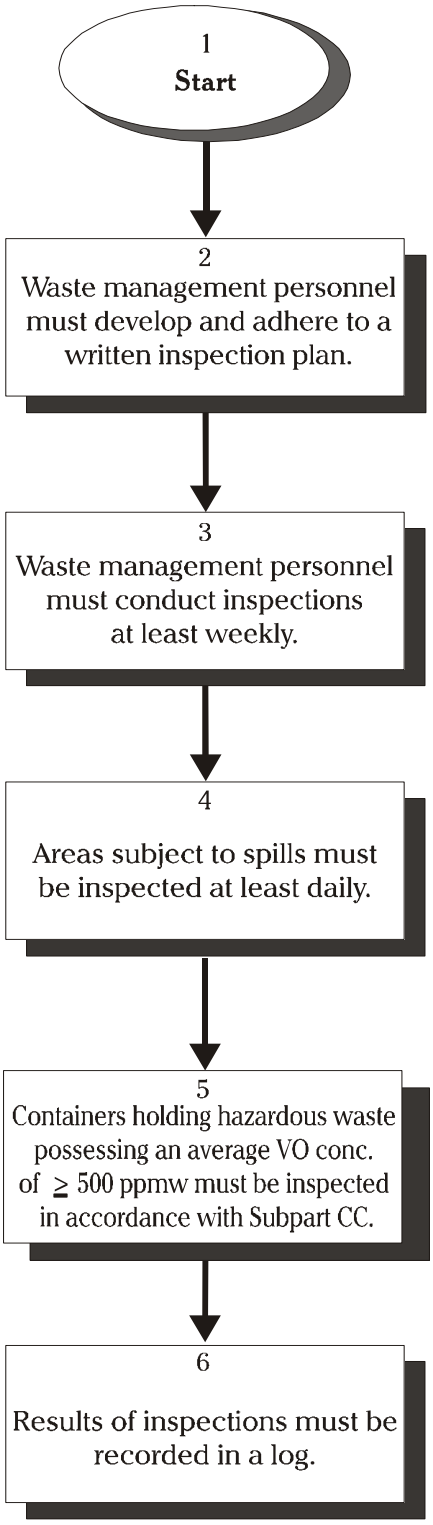
10) 40 CFR 264.179 -- Air emission standards.

11) 40 CFR 264/265 Subpart CC --Air emission standards for tanks, surface impoundments, and containers.

12) 29 CFR 1910 Subpart H -- Hazardous materials.

Module 3: Flowchart

SUBMODULE 3.4: INSPECTIONS



Note: Radiation Protection Standards under AEA may not allow compliance with normal RCRA container inspection requirements.

SUBMODULE 3.4 INSPECTIONS

Step 1 Start.

Step 2 Waste management personnel must develop and adhere to a written schedule for container inspections. The schedule must identify the types of potential problems (e.g., deteriorating containers or containment systems, improper container handling procedures) to be looked for during inspection and must be kept at the DOE operating facility. The inspection schedule must be submitted as part of the permit application and may be amended by the Regional Administrator or State Director (40 CFR 264.15 and 265.15).

Step 3 Under RCRA, inspections of container storage areas are normally conducted at least weekly to detect any leaking or deteriorating containers, faulty equipment, or deteriorating containment systems as early as possible. Operating personnel should visually inspect the containers in the storage area to detect any problems that may pose a threat to human health and the environment. The inspector should examine the surface of the containers for signs that their structural integrity has deteriorated. In particular, the inspector should check for corrosion, swelling, excessive dents, cracks, punctures or any other signs of deterioration (e.g., liquid on the surface of a container, leaks, spills). Containers should not be left open and should be handled in such a way as to minimize the potential for rupture. See Exhibit 3.4.1 for an example of a RCRA container storage area inspection checklist.

When conducting an inspection, waste management personnel should evaluate the security around the unit; determine whether there is sufficient aisle space; check for dead vegetation or stains in the storage run-off area; ensure that safety and emergency equipment is in proper working order; verify that evidence of past spills correlates with the operating record; and look for any drums that are being stored in an unauthorized area. An owner or operator must have a waiver from the local community fire marshal for storing containers of ignitable or reactive waste within 15 meters of the property boundary, but inside the storage facility structure. The inspector should also verify that the containment system is free from cracks, gaps, or other signs of deterioration and is without any standing liquids.

NOTE: for some of DOE's radioactive mixed waste streams, compliance with the normal RCRA container inspection requirements could result in radiological exposures to workers that exceed applicable AEA occupational exposure standards found in DOE Order 5480.11. In such cases, DOE field offices could seek agreement with EPA or a State on an alternative requirement (pursuant to RCRA Section 1006(a), which defers to the AEA in the event of inconsistent requirements). Such an alternative could require DOE to conduct less frequent visual inspections, but use robotics, video cameras, and release detection equipment rather than workers to ensure the integrity and condition of containers in storage.

Step 4 Areas subject to spills, such as loading and unloading areas and accumulation sites must be inspected daily when in use.

Step 5 Inspectors should visually inspect containers, covers, and closure devices for visible cracks, holes, gaps, or other passages into the interior of the container when hazardous wastes (unless they are remediation or ***mixed wastes*** only) entering the unit have greater than or equal to 500 ppmw VO concentration at the point of waste origination. Visual inspections must occur on or before the date they first manage hazardous waste or accept possession of the container (unless emptied within 24 hours of receipt); and annually thereafter.

Step 6 All inspections must be recorded in an inspection log that must be maintained for at least three years from the date of inspection. The inspection log must contain the date and time of inspection, the name of the inspector, a summary of any observations made during the inspection, and the date and nature of any repairs or other actions taken to address problems noted.

REFERENCES FOR SUBMODULE 3.4

1) *Inspections of RCRA Container Storage Areas,* U.S. Department of Energy, Office of Environmental Policy and Assistance, RCRA/CERCLA Division, RCRA Information Brief, EH-231-033/0793, July 1993.

2) *Federal Environmental Inspection Handbook,* U.S. Department of Energy, Office of Environmental Guidance, RCRA/CERCLA Division, Guidance Manual, DOE/EH-0220, October, 1991.

3) *Multi-Media Compliance Audit Procedures,* U.S. Environmental Protection Agency, National Enforcements Investigation Center, EPA-330/9-89-003-R, March 1989.

4) *RCRA Inspection Manual,* U.S. Environmental Protection Agency, Office of Waste Programs Enforcement, OSWER 9938.2A, March 1988.

5) *RCRA Subpart CC Organic Air Emission Standards: Containers,* DOE/EH-413/9801, U.S. Department of Energy, Office of Environment, Safety, and Health, RCRA/CERCLA Division, RCRA Information Brief, March 1998.

6) *RCRA Subpart CC Organic Air Emission Standards Technical Amendment Questions & Answers,* DOE/EH (RCRA)-9701, U.S. Department of Energy, Office of Environment, Safety, and Health, RCRA/CERCLA Division, Technical Assistance Project, March 1997.

7) 40 CFR 264.15 and 265.15 -- General inspection requirements.

8) 40 CFR 264.174 and 265.174 -- Inspections of container storage areas.

9) 40 CFR 264.179 and 40 CFR 265.178 -- Air emission standards.

10) 40 CFR 264.1086 and 265.1087 -- Standards: containers.

Exhibit 3.4.1
Inspection Checklist for RCRA Container Storage Areas

Section A -- Use and Management

1. Are containers in good condition? ___Yes ___No

2. Are containers holding hazardous wastes with an average volatile organic (VO) concentration greater than or equal to 500 parts per million by weight equipped with covers and closure devices, if applicable? ___Yes ___No

Section B -- Compatibility of Waste With Container

1. Is container made of a material that will not react with the waste which it stores? ___Yes ___No

Section C -- Management of Containers

1. Is container always closed while holding hazardous waste? ___Yes ___No

2. Is container handled so that it will not be opened, handled, or stored in a manner which may rupture it or cause it to leak? ___Yes ___No

Section D -- Inspections

1. Does owner/operator inspect containers at least weekly for leaks and deterioration? ___Yes ___No

2. Are containers holding hazardous wastes with an average VO concentration greater than or equal to 500 ppmw visually inspected on or before the date they are first managed or accepted, and annually thereafter? ___Yes ___No

Section E -- Containment (Part 264)

1. Do container storage areas have a containment system? ___Yes ___No

Section F -- Ignitable and Reactive Waste

1. Are containers holding ignitable and reactive waste located at least 15 m (50 ft) from facility property lines? ___Yes ___No

Exhibit 3.4.1
Inspection Checklist for RCRA Container Storage Areas (cont.)

Section G -- Incompatible Waste

1.	Are incompatible wastes or materials placed in the same containers?	___Yes ___No
2.	Are hazardous wastes placed in washed, clean containers when they previously held incompatible waste?	___Yes ___No
3.	Are incompatible hazardous wastes separated from each other by a berm, dike, wall, or other device?	___Yes ___No

Section H -- Closure (Part 264)

1.	At closure, were all hazardous wastes and associated residues removed from the containment system?	___Yes ___No

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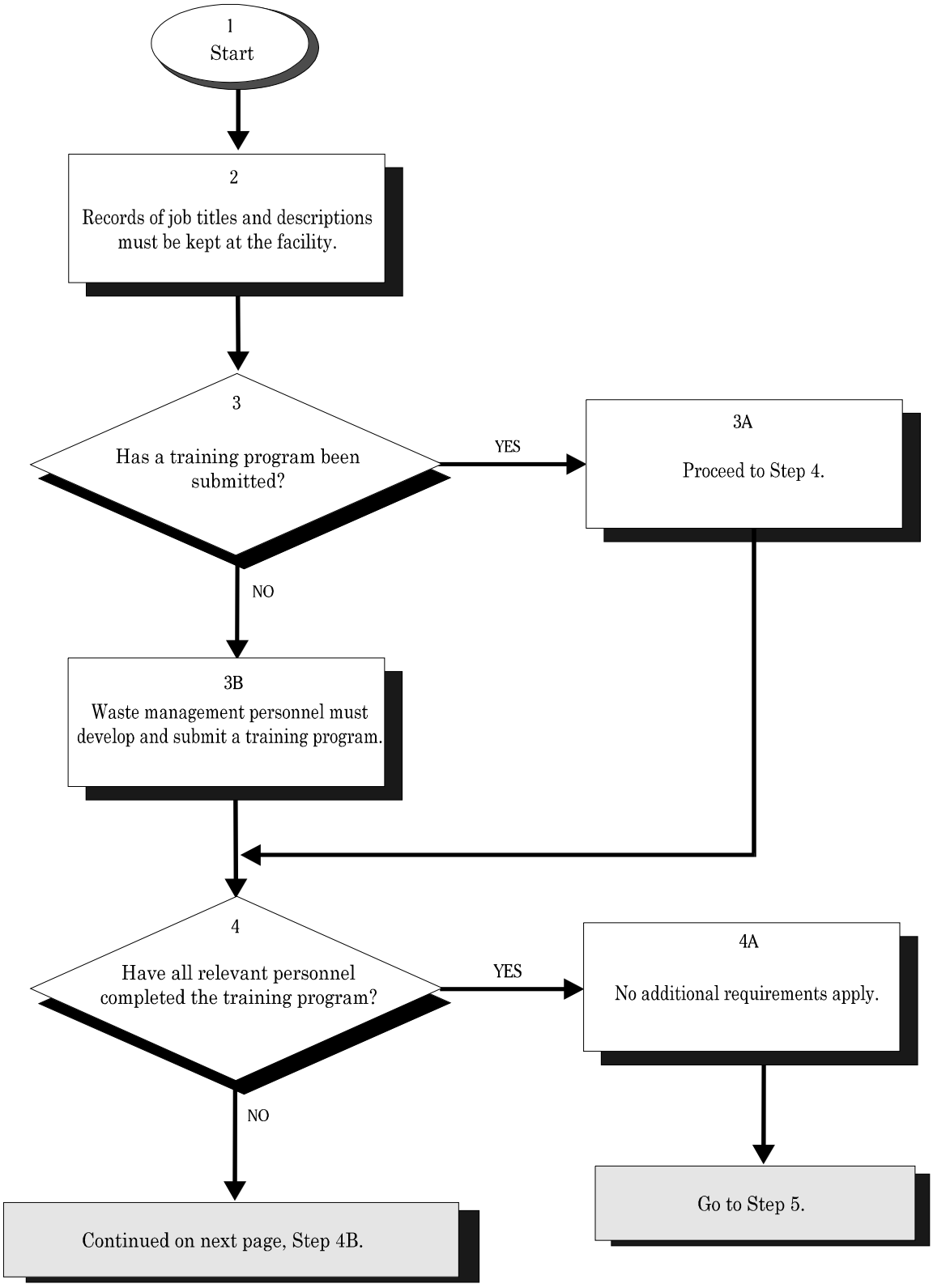
Module 3: Flowchart

SUBMODULE 3.5: PERSONNEL TRAINING



SUBMODULE 3.5 PERSONNEL TRAINING

Step 1 Start.

Step 2 Waste management personnel must keep records listing job titles and descriptions for all positions at the container storage area and the names of the employees filling each position. Waste management personnel must also keep records of all training programs for each affected employee until closure of the container storage area. Records on former employees must be kept for at least three years from the date the employee last worked at the container storage area (40 CFR 264.16 and 265.16).

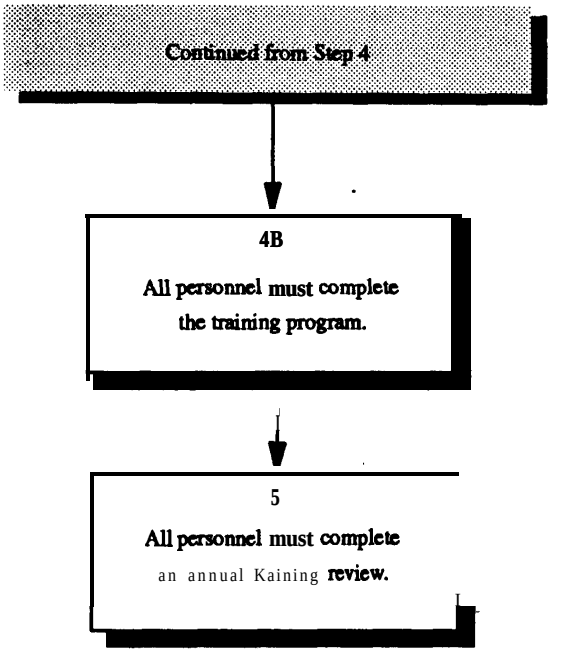
Step 3 As part of the RCRA Part B permit application, waste management personnel must develop and submit an outline of both introductory and continuing training programs, and a brief description of how the training programs are designed to meet actual job tasks (40 CFR 264.16 (a)(1) and Part 270).

Step 3A If a training program for the container storage area(s) has been submitted, proceed to Step 4.

Step 3B The training program must enable all personnel at the container storage area to respond effectively to emergencies by teaching them about emergency procedures, equipment, and emergency systems, including responses to ground-water contamination incidents, shutdown of operations, and procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment. In addition, operating personnel should consult OSHA training requirements contained in 29 CFR 1910.120(e) for more details (e.g., minimum number of hours, trainer qualifications, certifications).

Step 4 All operating personnel working at the container storage area must complete a training program within six months after the date of their employment or assignment to the container storage area, or to a new position at a facility. Note that training may be conducted at a facility-wide level, rather than for the container storage area alone.

Step 4A If all relevant personnel have completed the required training, proceed to Step 5.


Continued from Step 4
4B
All personnel must complete the training program.
5
All personnel must complete an annual Kaining review.

Step 4B All relevant operating personnel must successfully complete either classroom instruction or on-the-job training to perform his/her duties in a way that ensures the container storage area's compliance with all applicable requirements. The training program must be directed by a trainer knowledgeable in hazardous waste management procedures.

Step 5 All operating personnel must participate in an annual review of the initial training.

REFERENCES FOR SUBMODULE 3.5

1) *Training Accreditation Program (TAP1),* U.S. Department of Energy, Office of the Assistant Secretary for Environment, Safety, and Health, March 1, 1989.

2) 29 CFR 1910.106 -- Flammable and combustible liquids.

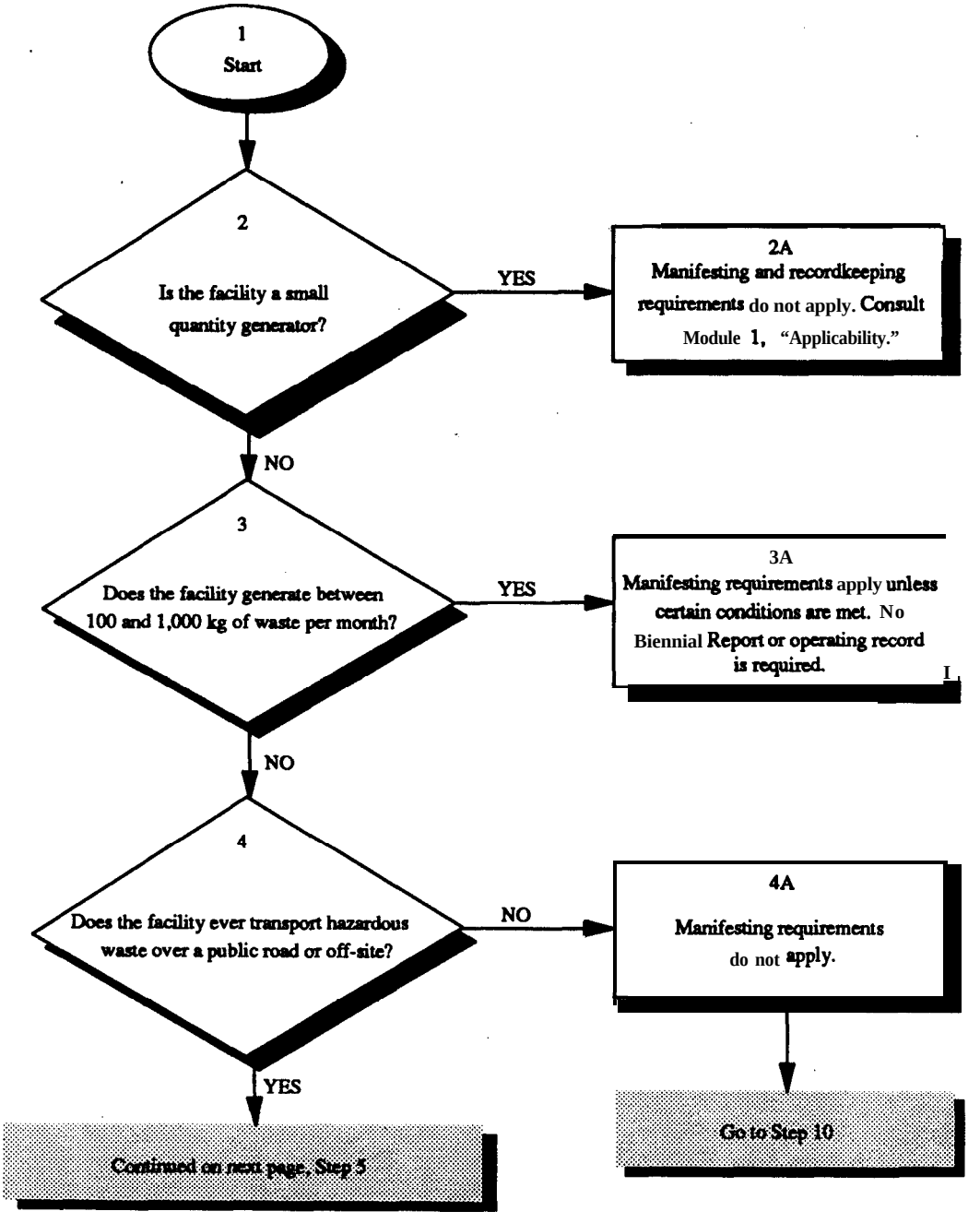
3) 40 CFR 264.16 -- Personnel training.

4) 40 CFR 270.14 -- Contents of Part B permit application: General requirements.

5) *OSHA Training Requirements for Hazardous Waste Operations*, U.S. Department of Energy, Office of Environment, Safety, and Health, RCRA/CERCLA Division, Guidance Manual, DOE/EH-0227P, December 1991.

Module 3: Flowchart

SUBMODULE 3.6: MANIFESTING AND RECORDKEEPING



SUBMODULE 3.6 MANIFESTING AND RECORDKEEPING

Step 1 Start.

Step 2 Waste management personnel should consult Module 1, "Applicability," to determine if the facility meets the conditionally exempt small quantity generator exclusion requirements.

Step 2A Facilities included in the conditionally exempt small quantity generator exclusion need not comply with RCRA manifesting requirements, nor are they required to submit a Biennial Report or maintain an operating record (see Step 4 below).

Step 3 Waste management personnel should refer to Module 1, "Applicability," to determine if the 100 kg to 1,000 kg generator exclusions apply.

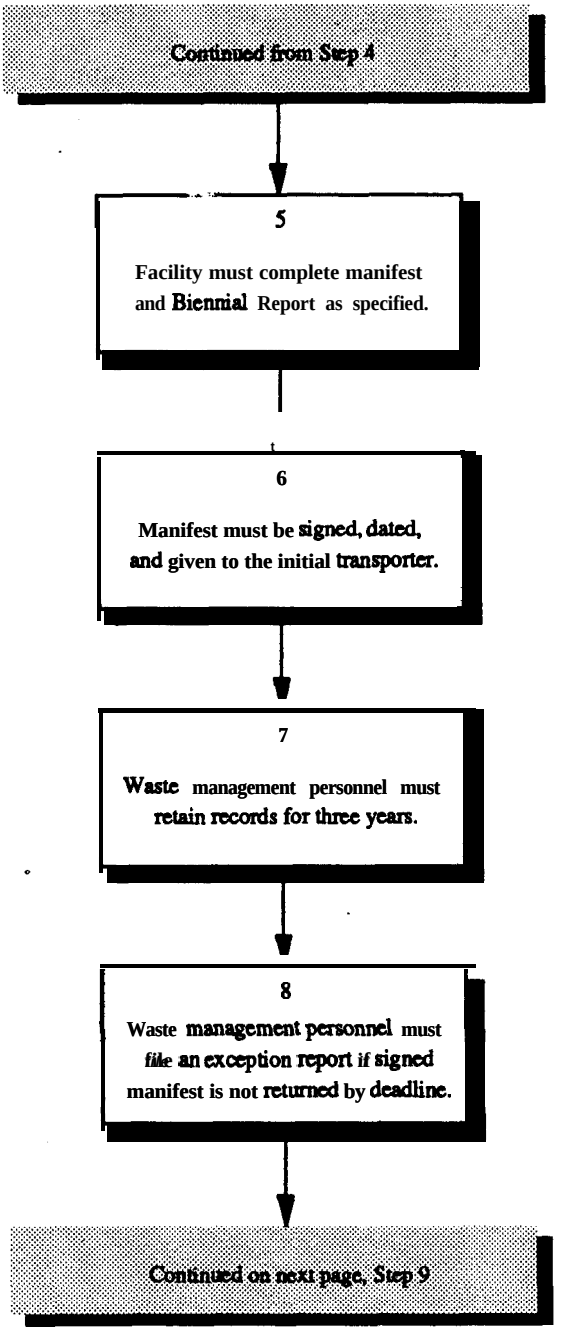
Step 3A DOE facilities that generate between 100 kg and 1,000 kg of hazardous waste in a calendar month must comply with the manifesting requirements unless both of the following requirements are met (40 CFR 262.20(e)):

- the waste is reclaimed under a contractual agreement that specifies the type of waste and frequency of shipments, provided that the transportation vehicle is owned and operated by the reclaimer of the waste; and
- waste management personnel maintain a copy of the reclamation agreement for a period of at least three years after termination or expiration of the agreement.

These facilities are not required to submit a Biennial Report nor maintain an operating record (see Step 4 below). However, these facilities must maintain records of waste analyses and comply with additional reporting requirements of 40 CFR 262.43 as directed by the Regional Administrator.

Step 4 Generators are not subject to the RCRA manifesting requirements if: (1) they generate hazardous waste, but treat, store, and dispose of all such hazardous waste on-site and do not transport it on a public road; and (2) they do not receive any hazardous waste from off-site sources.

Step 4A While these container storage areas are not subject to the manifesting requirements, they must comply with all applicable requirements for TSDFs, including operating record, biennial reporting, and other reporting requirements of 40 CFR Parts 264 and 265, Subpart E.


Continued from Step 4
5
Facility must complete manifest and Biennial Report as specified.
6
Manifest must be signed, dated, and given to the initial transporter.
7
Waste management personnel must retain records for three years.
8
Waste management personnel must file an exception report if signed manifest is not returned by deadline.
Continued on next page, Step 9

Step 5 Facilities that do not qualify for an exemption from these regulations must prepare a Manifest, OMB control number 2050-0039, using EPA form 8700-22 (a uniform hazardous waste manifest) and EPA form 8700-22A (continuation sheet), if necessary (40 CFR 262.20(a)) or equivalent State forms. A manifest is a critical document that allows DOE to track the movement of hazardous waste from the point of generation to the point of ultimate treatment, storage, or disposal. The manifest contains information such as: the names and EPA ID numbers of the generator, transporter, and the treatment, storage, or disposal facility; DOT waste codes; quantities of waste being transported; and the location of the ultimate destination for the hazardous or radioactive mixed waste. DOE facilities must use the manifest required by the State to which the shipment is manifested. If that State does not supply the manifest, DOE must use the manifest required by the State in which the facility is located. If neither the generator State nor the consignment State supply the manifest, then DOE may obtain a manifest from any source (40 CFR 262.21).

The manifest must consist of enough copies for the generator, each transporter, and the designated facility to each retain one copy, and an additional copy to be returned to the generator (40 CFR 262.22). Waste management personnel must designate on the manifest one facility which is permitted to manage the waste accompanied by the manifest. DOE may designate an alternate facility permitted to manage the waste in the event of an emergency. If a transporter is unable to deliver the waste to either of the facilities designated on the manifest, DOE must either designate another facility or instruct the transporter to return the waste to the point of generation. Examples of these manifest forms and instructions for completing them are included at the end of this submodule.

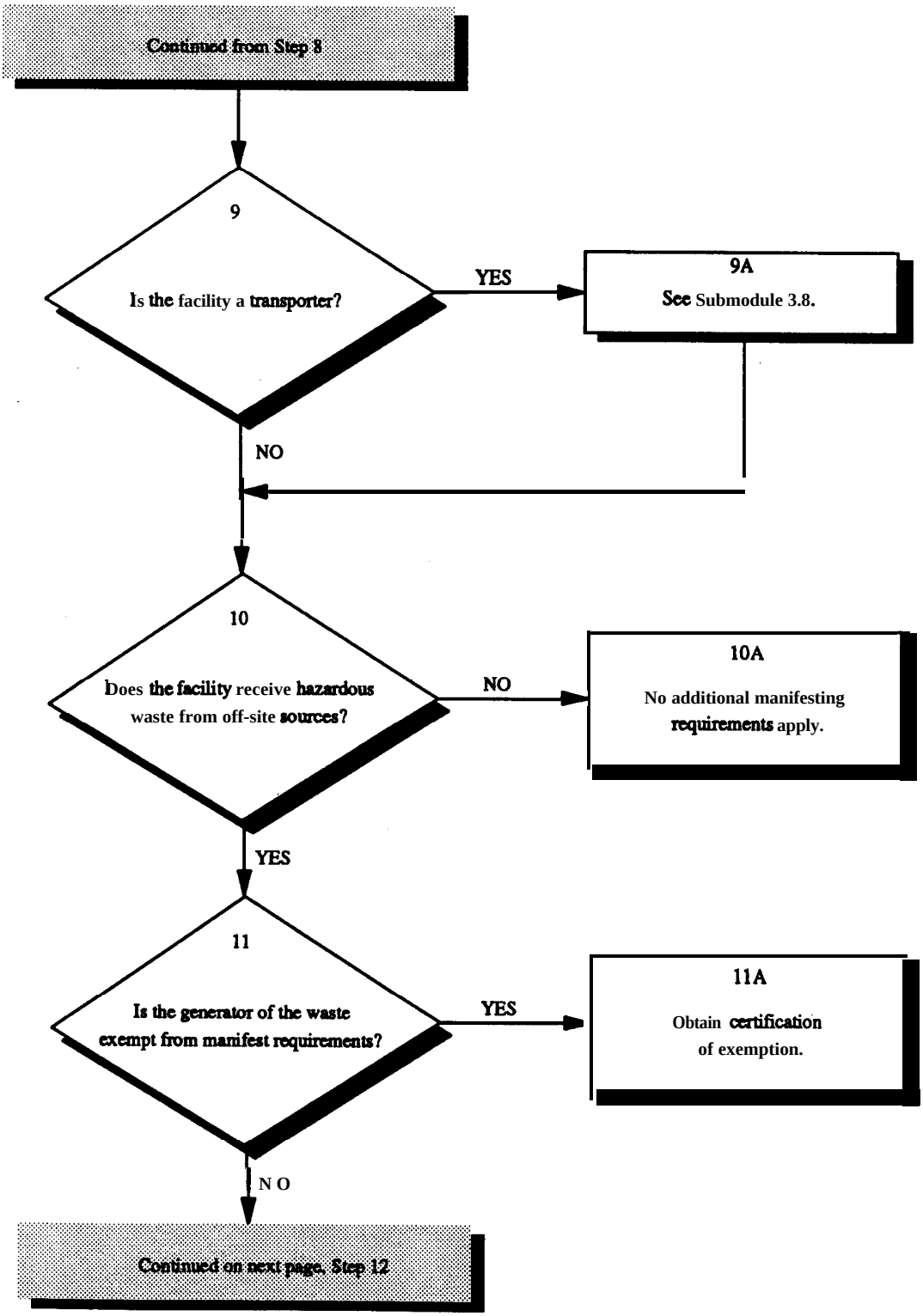
In addition, a generator shipping any hazardous waste off-site for treatment, storage, or disposal must prepare and submit a Biennial Report to the EPA Regional Administrator by March 1 of each even numbered year. The Biennial Report must be prepared and submitted in accordance with 40 CFR 262.41.

Step 6 Once the manifest is completed, the owner/operator, as the generator of the waste, must sign the manifest certification by hand, obtain the handwritten signature of the initial transporter, and retain one copy of the manifest for the facility files. The remaining copies of the manifest must be given to the initial transporter (40 CFR 262.23).

Step 7 The owner/operator must retain a copy of the original manifest for three years or until a signed copy of the manifest is received from the facility which eventually accepted the waste. This signed copy must be retained for at least three years from the date the waste was accepted by the initial transporter (40 CFR 262.40).

Step 8 For facilities generating more than 1,000 kilograms of hazardous waste in a calendar month, if 35 days pass from the date on which the original transporter accepted the waste and DOE has not received a manifest from the facility that ultimately received the waste, waste management personnel must contact the transporter and the owner/operator of the designated facility. If 45 days pass and DOE still has not received a manifest from the designated facility, waste management personnel must file an exception report with the Regional Administrator of the EPA or State Director. The exception report must include the generator's copy of the manifest and must describe the efforts to locate the waste as well as the result of these efforts (40 CFR 262.42).

For facilities generating between 100 and 1,000 kilograms of hazardous waste in a calendar month, if 60 days pass from the date on which the original transporter accepted the waste and DOE has not received a manifest from the designated facility, operating personnel must submit a copy of the manifest, with some indication that the they have not received confirmation of delivery to the Regional Administrator or State Director.


Continued from Step 8
9
Is the facility a transporter?
YES
9A
See Submodule 3.8.
NO
10
Does the facility receive hazardous waste from off-site sources?
NO
10A
No additional manifesting requirements apply.
YES
11
Is the generator of the waste exempt from manifest requirements?
YES
11A
Obtain certification of exemption.
NO
Continued on next page, Step 12

Step 9 Generally, waste management personnel operating a container storage area must be concerned with transporter requirements if they transport hazardous materials in containers over public highways or property. Submodule 3.8, "Transportation," should be consulted to confirm whether the facility is a transporter.

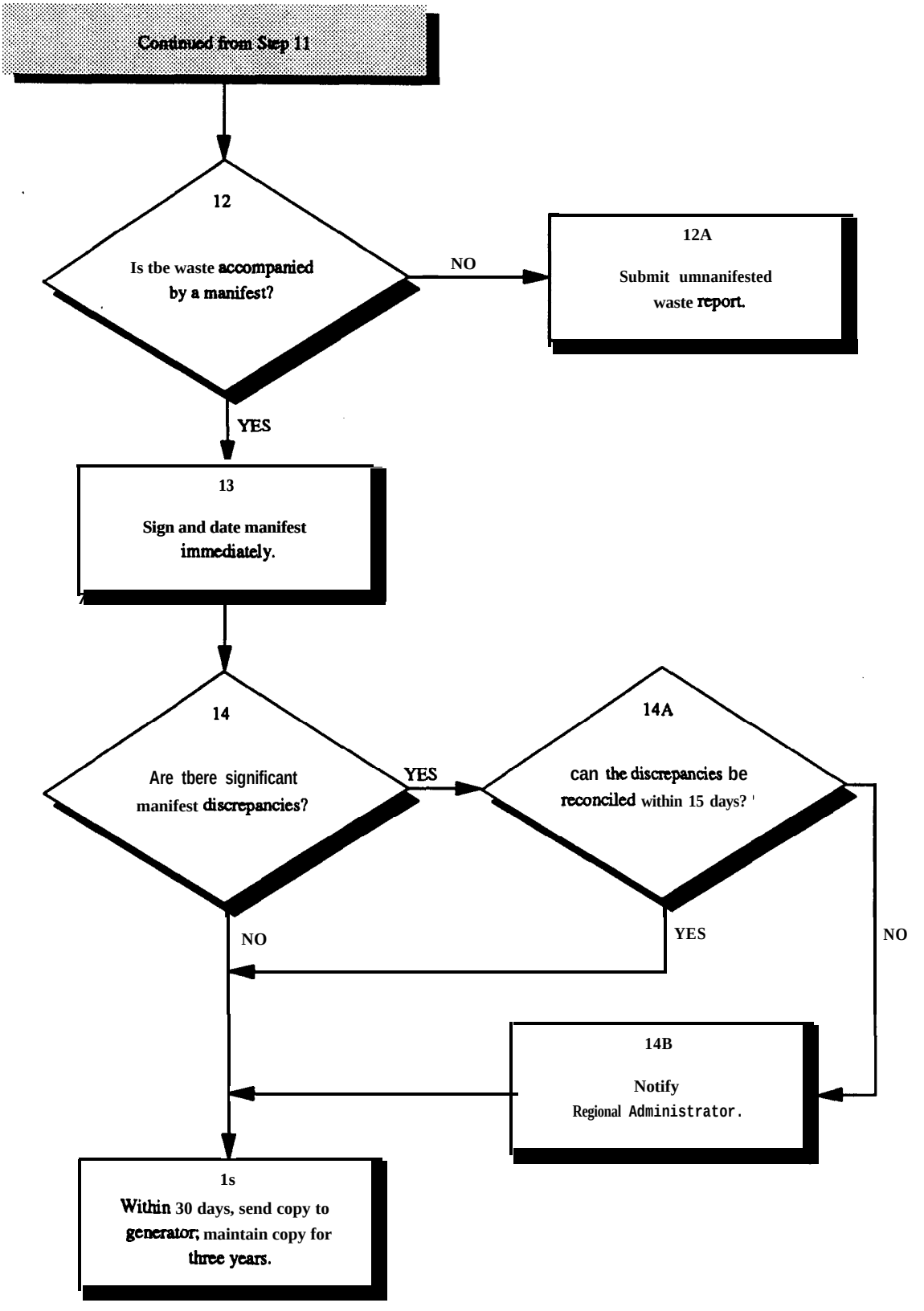
Step 9A Transporter manifesting requirements are discussed in Submodule 3.8, "Transportation."

Step 10 If the container storage area is receiving hazardous waste from off-site sources, then the facility may have to comply with additional manifesting requirements, outlined below.

Step 10A If the container storage area is not receiving hazardous waste from off-site sources, then waste management personnel do not have to comply with manifesting requirements applicable to designated receiving facilities.

Step 11 Wastes received at a container storage area must be accompanied by a manifest, or if received from a rail or water (bulk shipment) transporter, a shipping paper (40 CFR 264.71(b)), unless the waste was generated by a facility which is exempt from the manifesting requirements (e.g., conditionally exempt small quantity generator).

Step 11A In cases where the hazardous waste is excluded from manifest requirements, waste management personnel should obtain a certification that the waste qualifies for exemption from the generator.


Continued from Step 11
12
Is tbe waste accompanied by a manifest?
NO
12A
Submit umnanifested waste report.
YES
13
Sign and date manifest immediately.
14
Are tbere significant manifest discrepancies?
YES
14A
can the discrepancies be reconciled within 15 days?
NO
YES
NO
14B
Notify Regional Administrator.
1s
Within 30 days, send copy to generator; maintain copy for three years.

Step 12 Upon receipt of waste which is not excluded from the manifest requirements, waste management personnel should determine whether a manifest or shipping paper accompanies the waste.

Step 12A If waste management personnel receive a shipment of hazardous waste that is unmanifested or which does not include a shipping paper, and if the waste is not exempt from the manifesting requirements (Steps 3 and 4), then personnel must submit to the appropriate Regional Administrator a single copy of the unmanifested waste report (EPA form 8700-13B). A copy of this form and instructions for completion are included at the end of this submodule.

Step 13 Upon receipt of a shipment of hazardous waste, waste management personnel must sign and date each copy of the manifest, or shipping paper if appropriate, note any discrepancies, and immediately give the transporter at least one signed copy.

Step 14 Significant discrepancies in quantity of waste are defined as "variations greater than 10 percent in weight and, for batch waste, any variation in piece count" (40 CFR 264.72 (a)). Significant discrepancies in waste type are defined as obvious differences which can be discovered by inspection or waste analysis or toxic constituents not reported on the manifest. Waste management personnel are not required to perform analyses before signing the manifest. However, if during later analysis personnel discover a significant discrepancy, it must be reported to the Regional Administrator.

Step 14A Upon discovering a discrepancy, waste management personnel should attempt to reconcile the discrepancy with the generator as quickly as possible. If the discrepancy cannot be resolved in 15 days, additional reporting is required.

Step 14B If reconciliation cannot be made within 15 days after receipt of the waste, waste management personnel must submit a letter describing the discrepancy and attempts to reconcile it and a copy of the manifest or shipping paper to the EPA Regional Administrator.

Step 15 Within 30 days of receipt of the manifested waste, waste management personnel must send a copy of the manifest to the generator. In addition, personnel must retain a copy of the manifest for at least three years from the date of delivery.

REFERENCES FOR SUBMODULE 3.6

1) *PCB Manifesting, Tracking, and Reporting Requirements*, US. Department of Energy, Office of Environmental Guidance, RCRA/CERCLA Division, Information Brief, EH-231-001/1190, November, 1990.

2) 40 CFR 262 Subpart B -- Manifest requirements for generators.

3) 40 CFR 262.40 -- Recordkeeping.

4) 40 CFR 264 and 265 Subpart E -- Manifest system, recordkeeping, and reporting.

Exhibit 3.6.1
Uniform Hazardous Waste Manifest

Please print or type *(Form designed for use on elite (12-pitch) typewriter.)*

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of | Information in the shaded areas is not required by Federal law

3. Generator's Name and Mailing Address

4. Generator's Phone ( )

5. Transporter 1 Company Name | 6. US EPA ID Number

7. Transporter 2 Company Name | 8. US EPA ID Number

9. Designated Facility Name and Site Address | 10. US EPA ID Number

A. State Manifest Document Number

B. State Generator's ID

C. State Transporter's ID

D. Transporter's Phone

E. State Transporter's ID

F. Transporter's Phone

G. State Facility's ID

H. Facility's Phone

	11. US DOT Description *(Including Proper Shipping Name, Hazard Class, and ID Number)*	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.	I. Waste No.
GENERATOR	a					
	b					
	c					
	d					

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed Typed Name | Signature | Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed Typed Name | Signature | Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19

Printed/Typed Name | Signature | Month Day Year

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete

Exhibit 3.6.1
Uniform Hazardous Waste Manifest (cont.)

ease print or type (Form designed for use on elite (12-pitch) typewriter) Form Approved OMB No 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST *(Continuation Sheet)*	21 Generator's US EPA ID No	Manifest Document *No*	22 Page	Information in the shaded areas is not required by Federal law
23 *Generator s Name*			L State Manifest Document Number	
			M State Generator's ID	
24 Transporter ____ Company Name	25. US EPA ID Number		N. State Transporter's ID	
			0. Transporter's Phone	
26 *Transporter* ____ Company Name	27 US EPA ID Number		P. State Transporter's ID	
			Q. Transporter's Phone	

26 US DOT Description *(Including* Proper *Shipping Name. Hazard Class, and ID Number)*	29 Containers No	Type	30 Total Quantity	31 Unit Wt/Vol	R Waste No
a					
b					
c					
e					
g					
h					

S. Additional Descriptions for Materials Listed Above	T. Handling Codes for Wastes Listed Above

32 Special Handling Instructions and Additional Information

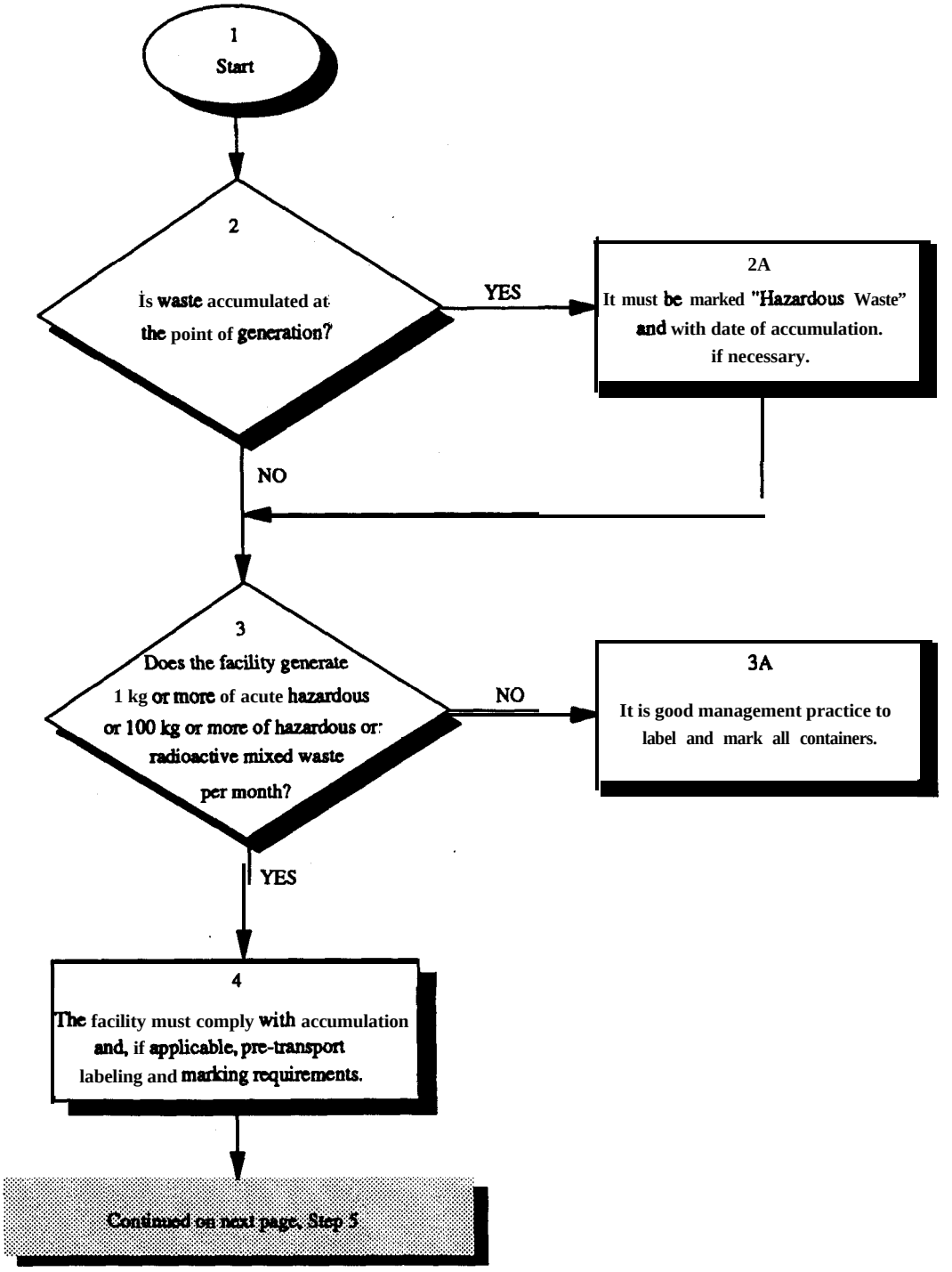
33 Transporter ____ Acknowledgement of Receipt of Materials		Date
Printed/Typed Name	Signature	Month Day Year
34 Transporter ____ Acknowledgement of Receipt of Materials		Date
Printed/Typed Name	Signature	Month Day Year

35 Discrepancy Indication Space

EPA Form 8700-22A (Rev. 9-86) Previous edition is obsolete

Module 3: Flowchart

SUBMODULE 3.7: LABELING AND MARKING



SUBMODULE 3.7 LABELING AND MARKING

Step 1 Start.

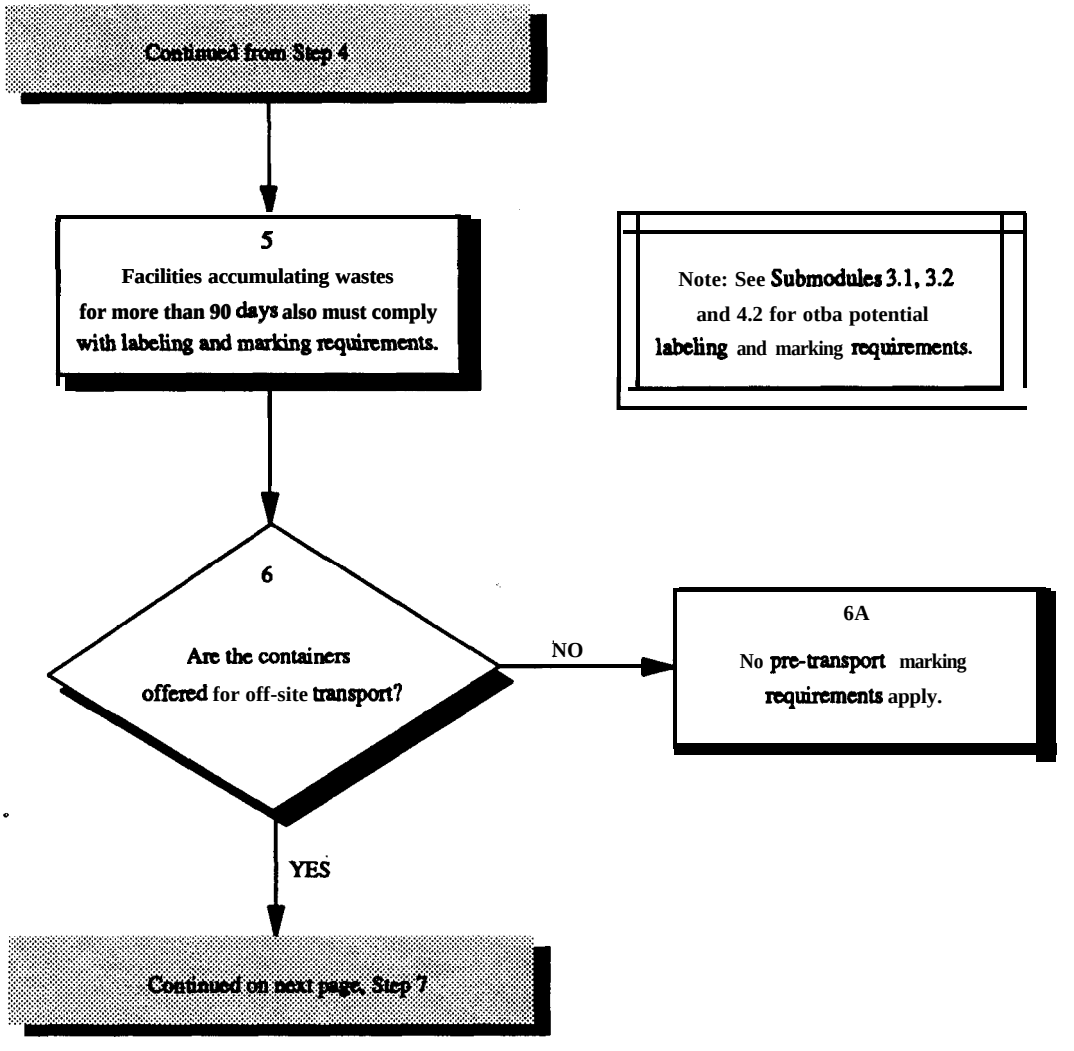
Step 2 Operating personnel may accumulate wastes in containers at the point of generation (up to 55 gallons of hazardous waste or one quart of acutely hazardous waste) without triggering the RCRA permitting or interim status storage requirements. These areas are termed satellite accumulation areas. Certain marking requirements apply to these areas (40 CFR 262.34 (c)(1) & (c)(2)).

Step 2A The containers must be marked with the words "Hazardous Waste." If the waste accumulates in amounts in excess of those specified above, the containers holding the excess waste must be marked with the date the excess amount began accumulating. Module 1, "Applicability," (page 1-12) outlines additional requirements for facilities which exceed the 55 gallon limit.

Step 3 If a facility generates less than 1 kg of acutely hazardous, or less than 100 kg of hazardous waste per month, the facility is defined as a "conditionally exempt small quantity generator."

Step 3A While RCRA does not require marking and labeling of conditionally exempt small quantity generator waste, it is good management practice to handle all hazardous waste in accordance with RCRA labeling and marking requirements, regardless of whether small quantity generator thresholds are exceeded.

Step 4 The facility must comply with RCRA accumulation labeling and marking requirements (40 CFR 262.34) and, when offered for off-site transport, RCRA pre-transport labeling and marking requirements (40 CFR 262.31 & 262.32) and DOT requirements of 49 CFR Part 172. Labels are intended to allow for quick identification of the wastes in the containers, and are therefore large in size and easy to read from a distance. Markings, on the other hand, describe in detail the name, instructions, cautions, and weights of the waste in the container. (Placarding requirements for transport vehicles are discussed in Submodule 3.8, "Transportation").

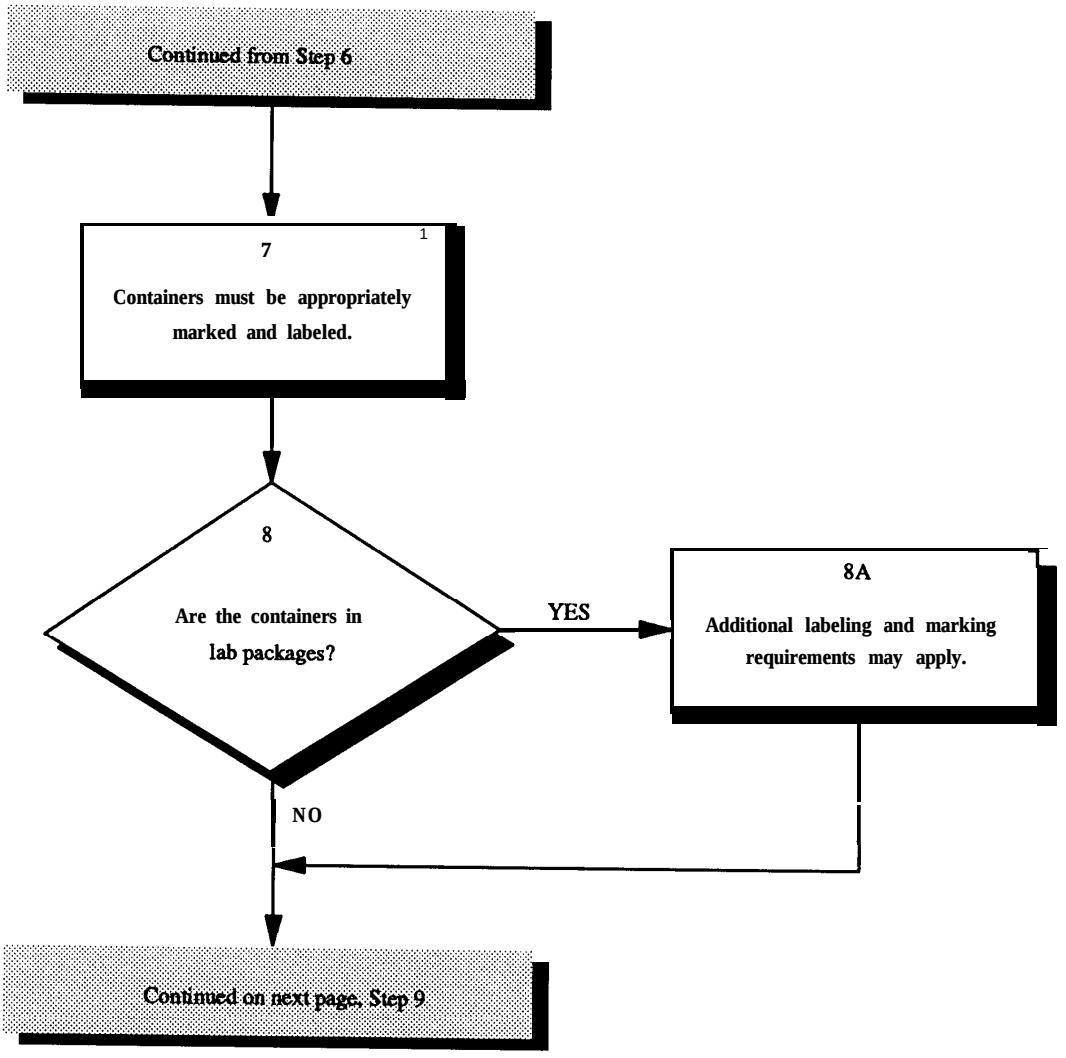

Continued from Step 4
5
Facilities accumulating wastes for more than 90 days also must comply with labeling and marking requirements.
Note: See Submodules 3.1, 3.2 and 4.2 for otba potential labeling and marking requirements.
6
Are the containers offered for off-site transport?
NO
6A
No pre-transport marking requirements apply.
YES
Continued on next page, Step 7

Step 5 Facilities that accumulate hazardous waste for more than 90 days, without having been granted an extension by the Regional Administrator or State Director, are considered storage facilities, and are subject to all applicable requirements of 40 CFR Parts 264 or 265. These facilities must comply with marking and labeling requirements that will have been specified in the permit. Labeling or marking requirements for interim status facilities storing wastes that are generated on site are not explicitly established by regulation in 40 CFR 265; however, to operate an interim status container storage area prudently, waste management personnel should label and mark containers so they are easily identifiable and properly handled.

NOTE: see Submodule 3.1, "Waste Analysis," Submodule 3.2, "Compatibility," and Submodule 4.2, "Contingency Plans," for additional container management requirements that may necessitate specific labeling and marking requirements.

Step 6 Prior to transporting hazardous waste off-site, waste management personnel must label and mark each container as specified by RCRA pre-transport labeling and marking requirements (40 CFR 262.31 & 262.32) and Department of Transportation regulations (49 CFR Part 172).

Step 6A Pre-transport marking requirements do not apply to containers not offered for off-site transport.


Continued from Step 6
7
Containers must be appropriately marked and labeled.
8
Are the containers in lab packages?
YES
8A
Additional labeling and marking requirements may apply.
NO
Continued on next page, Step 9

Step 7 All containers holding a hazardous waste or radioactive mixed waste offered for transport must be labeled in accordance with RCRA requirements (40 CFR 262.31) and as specified by DOT requirements (49 CFR 172.101 or 172.102). Waste management personnel should consult the tables in those sections and label the containers as directed. Additional requirements are located in 49 CFR 172.400 - 172.406.

Labels must be affixed to the surface of the container near the marked proper shipping name. However, labels may be fixed by other suitable means (e.g., tag) to: (1) a container that is smaller than the required label if it contains no radioactive waste; (2) a compressed gas cylinder; or (3) a container has such an irregular surface that a label cannot be satisfactorily affixed. Labels must not be obscured by markings or attachments. All labels must be attached to a background of contrasting color, or must have a dotted or solid line outer border. If two or more labels are required, they must be displayed or affixed next to each other. If a container has a volume of 64 cubic feet or more, labels must be displayed on at least two sides or ends of the container.

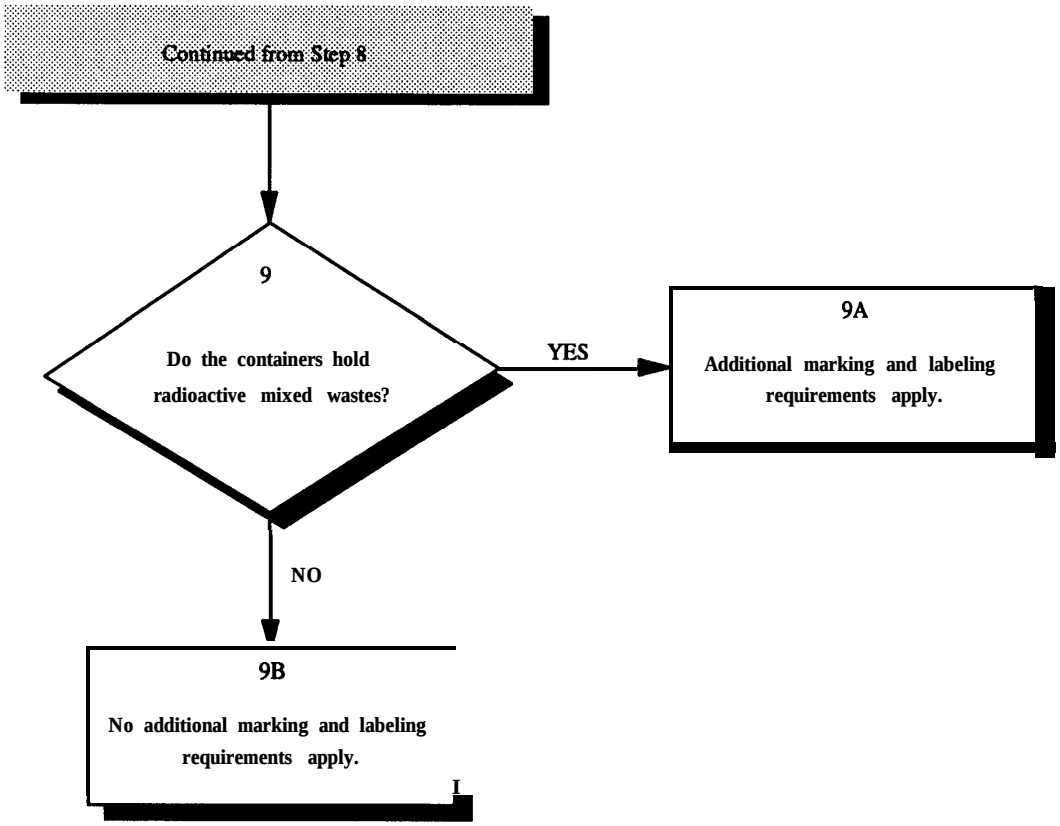
Containers must be marked in accordance with 40 CFR 262.32 and as specified in 49 CFR 172.300. All markings must be durable, in English, affixed to the surface of the container or on a tag, or sign, displayed on a background of sharply contrasting color, unobscured by labels or attachments, and located away from other markings that could substantially reduce their effectiveness. Each container of 110 gallons or less must be marked with the following words:

> "HAZARDOUS WASTE--Federal Law Prohibits Improper Disposal.
> If found, contact the nearest police or public safety authority or the
> U.S. Environmental Protection Agency.
> Generators Name and Address_____.
> Manifest Document Number_____."

Examples of the proper labels and markings are included at the end of this submodule.

Step 8 A lab package is defined as any container that holds smaller containers of hazardous waste. A lab pack need not contain laboratory wastes per se.

Step 8A Lab packs must be packed with closures upward and must be marked "THIS SIDE UP" or "THIS END UP," as appropriate. Lab packs must also be marked with an arrow symbol as specified in ANSI MH6.11968. Labeling requirements for lab packs are found in 49 CFR 172.404(a). In general, the outside of a lab pack must be labeled to comply with the requirements for all the materials contained in the lab pack (i.e., lab packs with multiple wastes must be marked and labeled to describe all of the wastes contained in the lab pack). See also 49 CFR 173.12.


Continued from Step 8
9
Do the containers hold radioactive mixed wastes?
YES
9A
Additional marking and labeling requirements apply.
NO
9B
No additional marking and labeling requirements apply.

Step 9 Containers holding radioactive mixed wastes are subject to additional requirements.

Step 9A Containers holding radioactive mixed waste that are to be offered for transport must comply with DOT marking and labeling requirements for radioactive materials to the extent applicable. DOT labeling requirements for radioactive materials are located in 49 CFR 172.403 and are based on the radiation level at the surface of the container, the DOT "transport index" as defined in 49 CFR 173.403, and the fissile characteristics of the package. DOE marking requirements for radioactive material are located in 49 CFR 172.403 and are based on the size of the container and the type of radioactive material.

Step 9B No additional marking and labeling requirements apply.

REFERENCES FOR SUBMODULE 3.7

1) 40 CFR 262.31 -- Labeling.

2) 40 CFR 262.32 -- Marking.

3) 40 CFR 262.33 -- Placarding.

4) 40 CFR 262.34 -- Accumulation time.

5) 49 CFR Part 172 -- Hazardous materials table.

6) ANSI MH6.11968.

Exhibit 3.7.1
Examples of Proper Labels

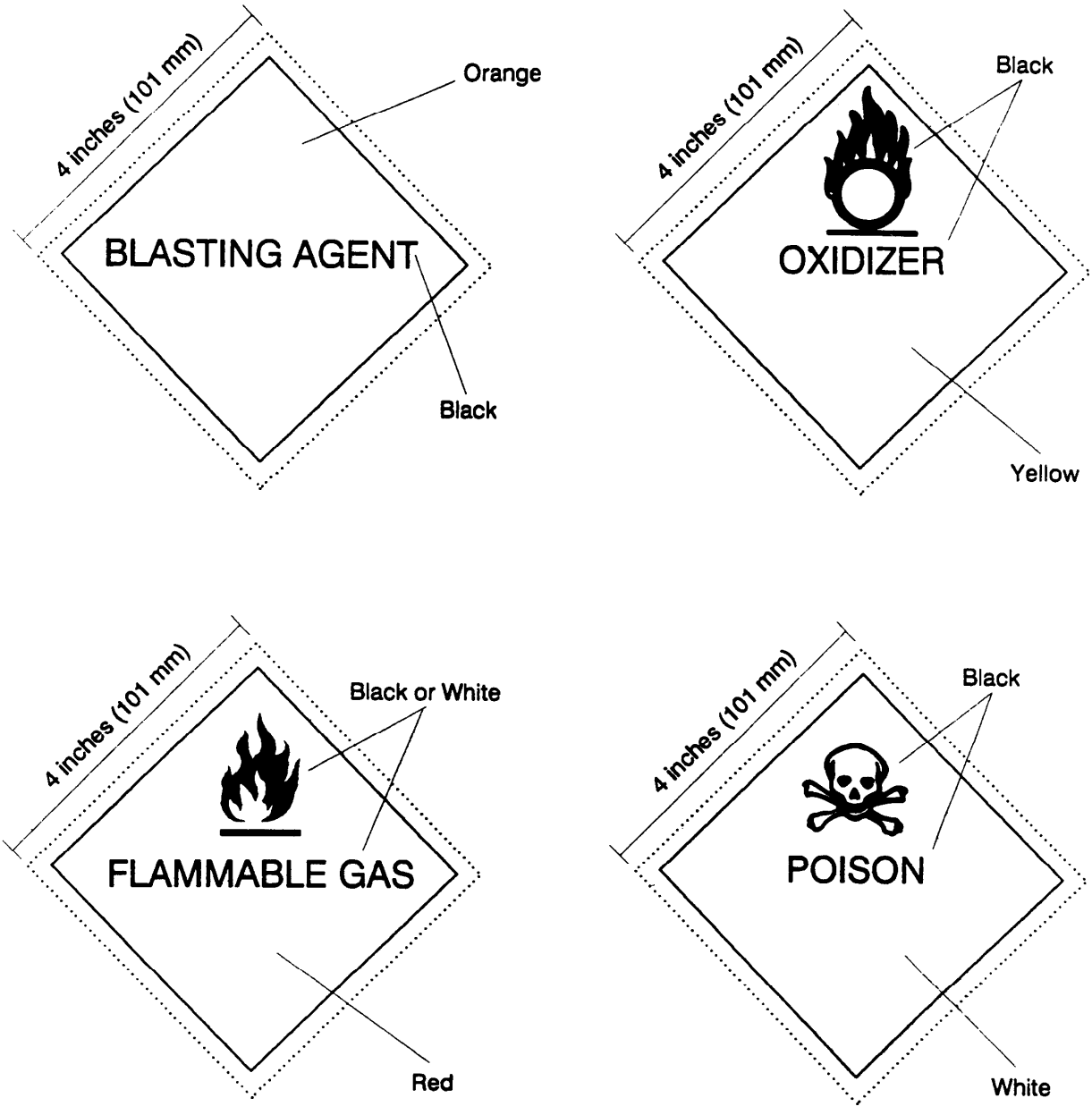


Exhibit 3.7.2
Examples of Proper Markings

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATOR'S NAME _____ EPA # _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

EPA/DOT SHIPPING NAME _____ EPA WASTE CODE # _____

CONSTITUENTS _____ _____

_____ _____

_____ _____

HAZARD CLASS _____ UN/NA NO. _____

EMERGENCY RESPONSE GUIDE # _____

"RQ"

☐ 5000 lbs. ☐ 100 lbs. ☐ 1 lb.
☐ 1000 lbs ☐ 10 lbs.

DATE OF ACCUMU-LATION _____

MANIFEST DOCUMENT # _____

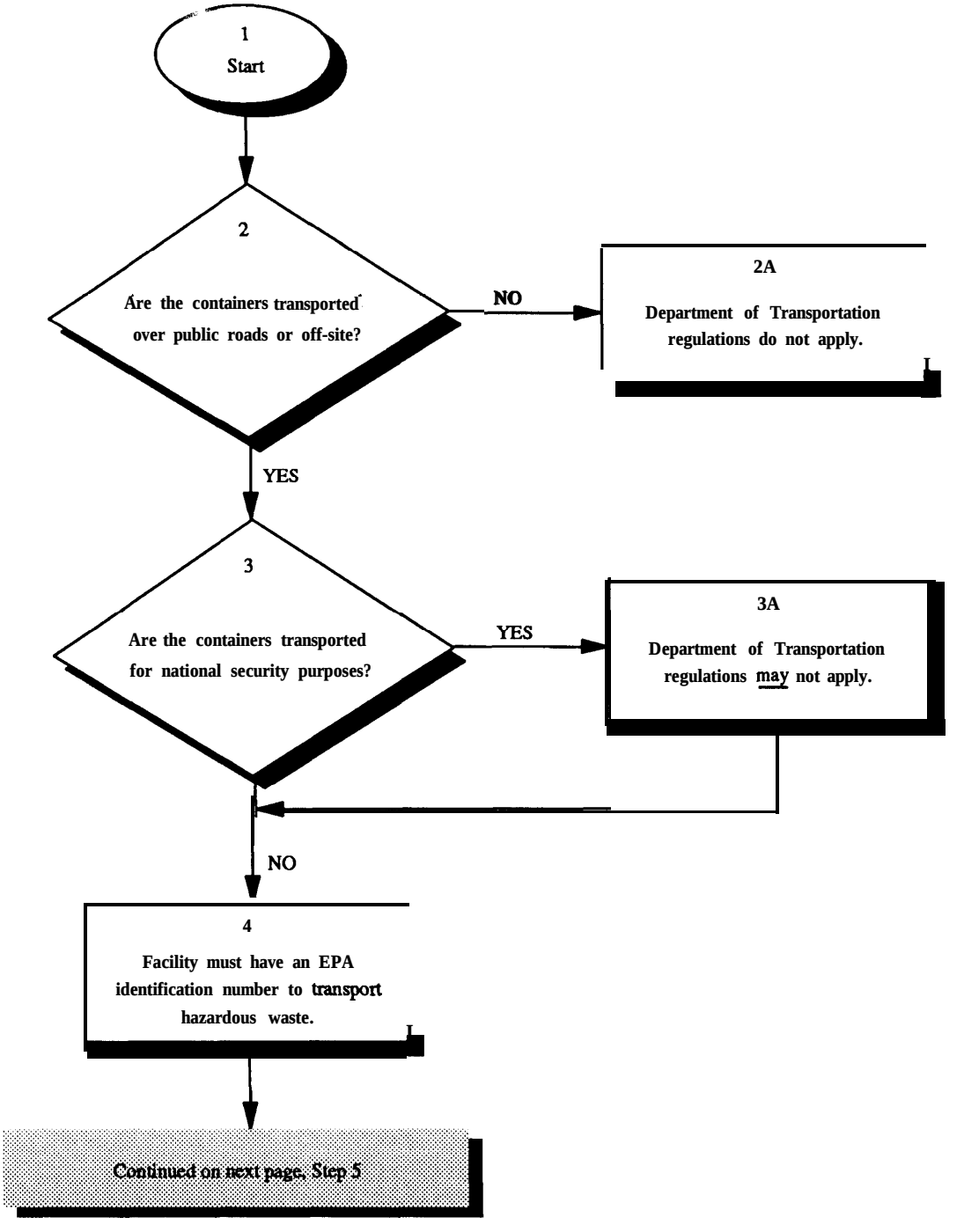
WHEN HANDLING OR DURING ROUTINE OR EMERGENCY EXPOSURE TO THE HAZARDOUS WASTE IN THIS CONTAINER, USE THE SAFETY EQUIPMENT CHECKED BELOW:

☐ Hard Hat
☐ Safety Glasses
☐ Safety Goggles
☐ Full Face Shield
☐ Protective Gloves
☐ Splash Apron
☐ Protective Boots

☐ Respiratory Protection
☐ Air-purifying Respirator Type _____
☐ Fully Encapsulated Suit
☐ Atmosphere Supplying Respirator Type _____

Module 3: Flowchart

SUBMODULE 3.8: TRANSPORTATION



SUBMODULE 3.8 TRANSPORTATION

Step 1 Start.

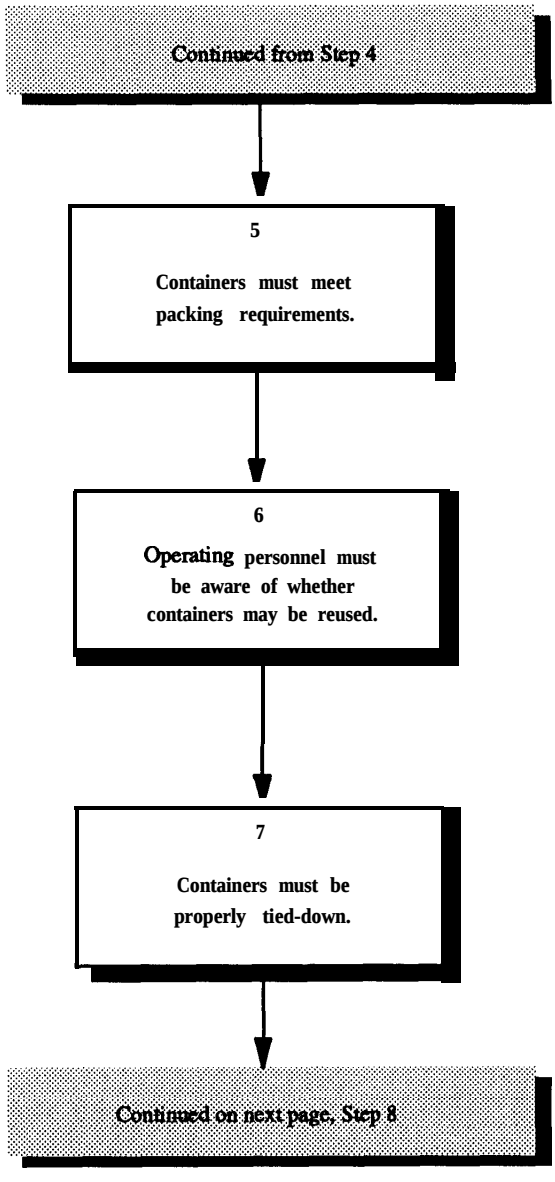
Step 2 Hazardous waste in containers is subject to Department of Transportation regulations and RCRA transportation regulations when the waste is transported outside of DOE property or on a public road. A "public road" should be interpreted to mean any motor vehicle right of way open to unrestricted public access. Additionally, it is good management practice to use DOT-approved containers and placards when transporting hazardous wastes solely on DOE property, if it is likely that significant vehicular traffic will be encountered.

Step 2A If the hazardous waste containers are transported only within a facility, transportation regulations do not apply.

Step 3 Questions regarding the national security exemption from transportation requirements for specific DOE shipments should be referred to DP-1 for resolution at the Headquarters level.

Step 3A Shipments of hazardous waste made by or for DOE for the purpose of national security, and which are escorted by designated waste management personnel, may be exempted from the regulations of 49 CFR Parts 171 through 178, on a case-by-case basis.

Step 4 Before transporting a waste, the facility must obtain an EPA identification number from the Regional Administrator (40 CFR 263.11). An EPA identification number may be obtained by completing EPA form 8700-12 if one has not already been obtained.


Continued from Step 4
5
Containers must meet packing requirements.
6
Operating personnel must be aware of whether containers may be reused.
7
Containers must be properly tied-down.
Continued on next page, Step 8

Step 5 Department of Transportation regulations (40 CFR Parts 173, 178, and 179) specify the types of containers and proper construction for containers to be used to transport hazardous waste. In general, 40 CFR Part 173 specifies the types of containers acceptable for different kinds of hazardous waste, while Parts 178 and 179 specify the proper construction of the containers. When shipping hazardous waste in containers, operating personnel also are responsible for ensuring that the hazardous waste is labeled and marked in accordance with 49 CFR Part 172. See Submodule 3.7, "Labeling and Marking" for a discussion of labeling and marking requirements.

All containers used for transportation must be constructed so that under conditions normally incident to transportation; (1) there will be no significant release of the hazardous materials to the environment; (2) the effectiveness of the container will not be substantially reduced; and (3) there will be no mixture of gases or vapors in the container which could significantly reduce the effectiveness of the container.

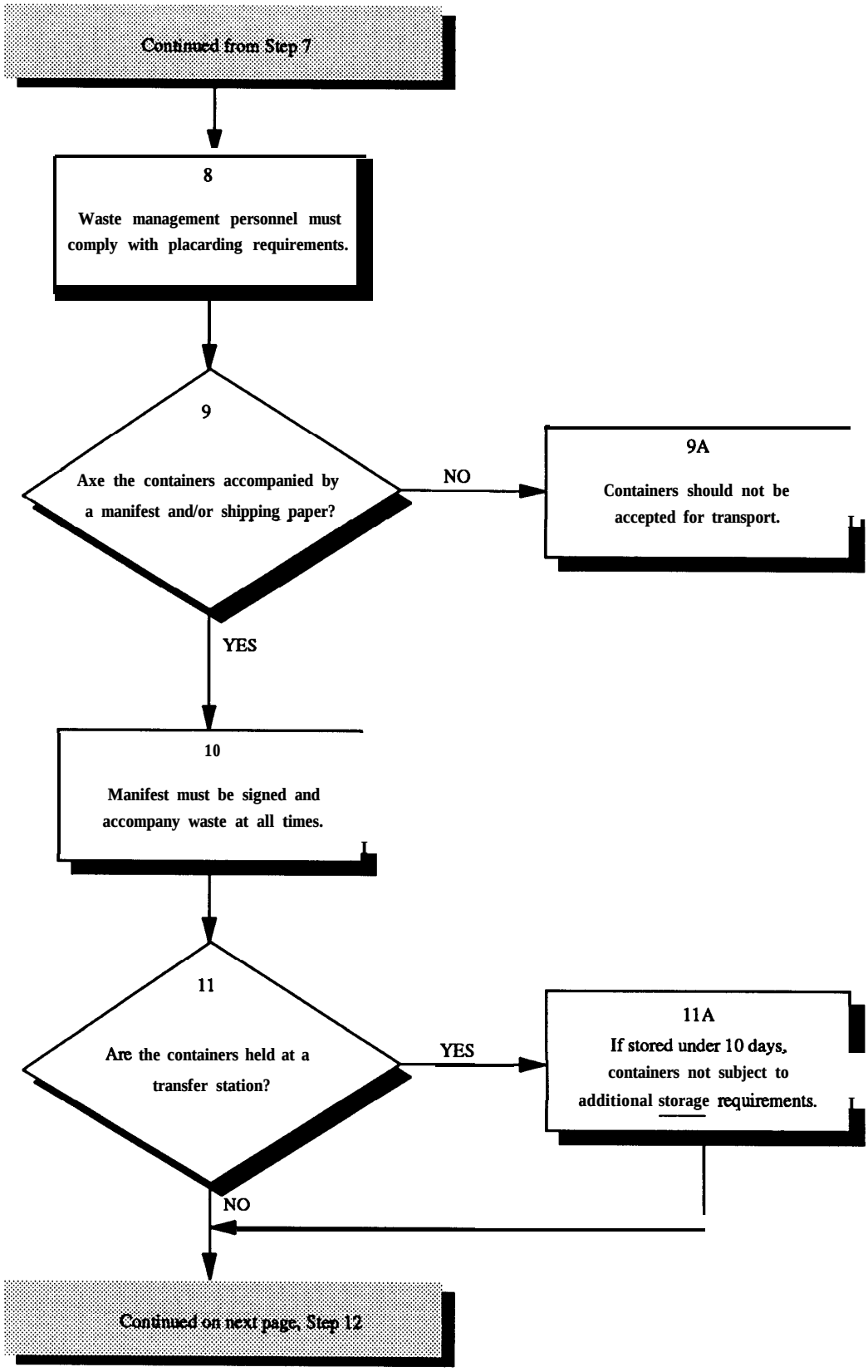
Step 6 Operating personnel should be aware that any containers labeled as single trip or non-reusable may only be used once to ship hazardous waste. Operating personnel may re-use containers for transportation provided that the container meets all the requirements for new containers of the same type. Old markings must be thoroughly removed and new markings and labels must be easily readable. A metal plate with the necessary markings on it may be securely fastened to the container if necessary.

Step 7 In tying down hazardous waste containers, operating personnel should only use materials with a strength rating established and documented by the manufacturer. The following should not be used as components of a tiedown system (DOE Order 1540.1 *Materials Transportation and Traffic Management*):

- plastic or fiber rope;
- any material with unknown strength; and
- any damaged material.

Waste management personnel should use materials with elastic properties if possible. For example, wire rope is preferable to chain because it is more flexible and therefore better able to withstand the stresses of transportation.

The principal tiedown forces should be transmitted to the vehicle frame. In addition, the strength of the tiedown points should be greater than or equal to the strength of the tiedowns themselves. Operating personnel should be ensure that the tiedown assemblies are free from contact with stationary objects, that the tiedowns are not kinking, crimping, or splaying, and that the tiedowns will not loosen during transportation. The tiedowns should not be exposed to dirt, weather extremes, rain, or corrosives which may reduce the effectiveness of the tiedowns. Finally, it is the responsibility of waste management personnel to ensure that the tiedowns are inspected regularly, and that the tiedowns are tightened when necessary.


Continued from Step 7
8
Waste management personnel must comply with placarding requirements.
9
Axe the containers accompanied by a manifest and/or shipping paper?
NO
9A
Containers should not be accepted for transport.
YES
10
Manifest must be signed and accompany waste at all times.
11
Are the containers held at a transfer station?
YES
11A
If stored under 10 days, containers not subject to additional storage requirements.
NO
Continued on next page, Step 12

Step 8 Each transport vehicle and freight container transporting hazardous waste must comply with placarding requirements. If a commercial carrier is transporting hazardous waste, waste management personnel must provide the transporter with the appropriate placards. Tables 1 and 2 of Subpart F of 49 CFR Part 172 specify the types of placards required for different substances. Waste management personnel must also be aware of specific requirements for materials posing an inhalation hazard, materials which are only residues, and for vehicles which have been fumigated (49 CFR Part 172, Subpart F).

Placards must be readily visible and must be securely attached to the vehicle and may not be placed next to any marking that may reduce their effectiveness and should not be placed so that water or dirt from the wheels of the vehicle are directed at the placard. Placards must be displayed horizontally so that words can be read from left to right. All placards must meet the regulations of 49 CFR 172.519 - 172.558. These regulations specify the proper construction, size, and wording of the placards. In addition, Appendix C of 49 CFR Part 172 contains specifications for placard holders. Placards are not required for: (1) a transport vehicle or freight container holding less than 1,000 pounds aggregate gross weight of hazardous materials, as long as those materials are not required to meet the poison-inhalation hazard shipping paper requirements; and (2) a rail car loaded with transport vehicles or freight containers, none of which needs to be placarded.

Step 9 When transporting hazardous waste in containers, waste management personnel must comply with the manifesting requirements of Subpart B of 40 CFR Part 263, unless specifically exempted (see Submodule 3.6, "Manifesting and Recordkeeping").

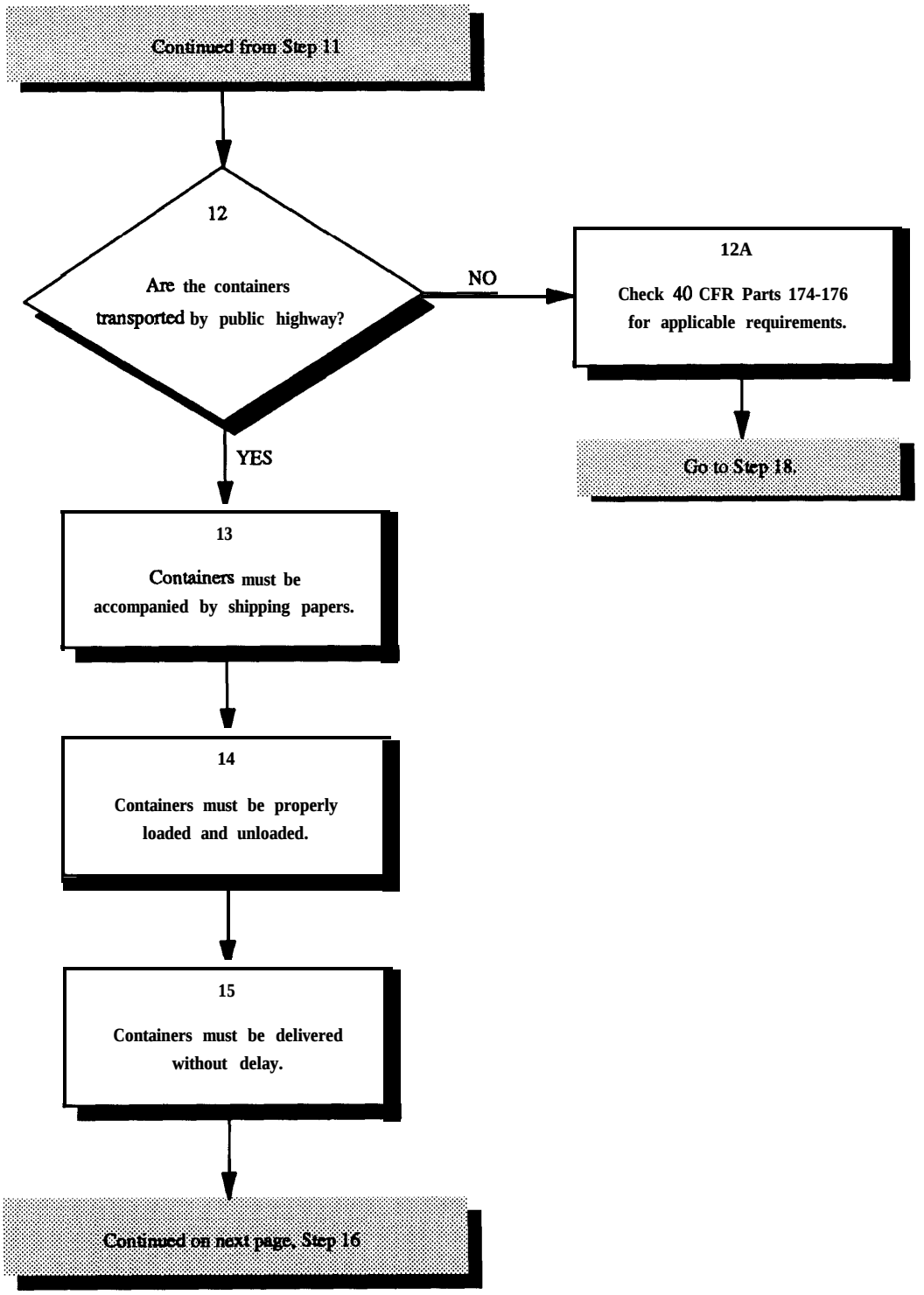
DOT requirements specify that all hazardous waste transported must be accompanied by a shipping paper (49 CFR 172.200); however, a properly completed manifest will serve in lieu of a shipping paper. If the manifest has not been received by the facility or transporter receiving the waste, waste management personnel must obtain the date of delivery and handwritten signature of the receiver of the waste from the DOT shipping paper, if available (see Step 13). General DOT shipping paper requirements are specified in 49 CFR 172 Subpart C.

Step 9A Transporters may not accept hazardous waste containers from a generator unless they are accompanied by a properly signed and completed manifest. In some cases (i.e., when shipping waste to the designated facility by water, or for shipments involving rail transport), the shipping paper may serve in lieu of the manifest (40 CFR 263.20).

Step 10 Before transporting the waste, waste management personnel must sign and date the manifest to acknowledge acceptance of the waste from the DOE facility that generated the waste. A signed copy of the manifest must then be returned to the originating facility before the waste leaves the property. During transportation, the manifest must accompany the hazardous waste at all times. When the waste is delivered, either to another transporter or to the receiving facility, waste management personnel must obtain a handwritten signature and date on the manifest. One copy of this signed manifest should be retained by the transporter and the remaining copies should be given to the receiver of the waste.

Step 11 A transfer station is any transportation related facility, including loading docks, parking areas, storage areas, and other similar areas where shipments of hazardous waste are held during the normal course of transportation.

Step 11A If DOE stores manifested shipments of hazardous waste in containers at a transfer facility for less than ten days, then the storage of those wastes are not subject to regulation under 40 CFR Parts 264, 265, 268, and 270. Transportation requirements still apply.


Continued from Step 11
12
Are the containers transported by public highway?
NO
12A
Check 40 CFR Parts 174-176 for applicable requirements.
Go to Step 18.
YES
13
Containers must be accompanied by shipping papers.
14
Containers must be properly loaded and unloaded.
15
Containers must be delivered without delay.
Continued on next page, Step 16

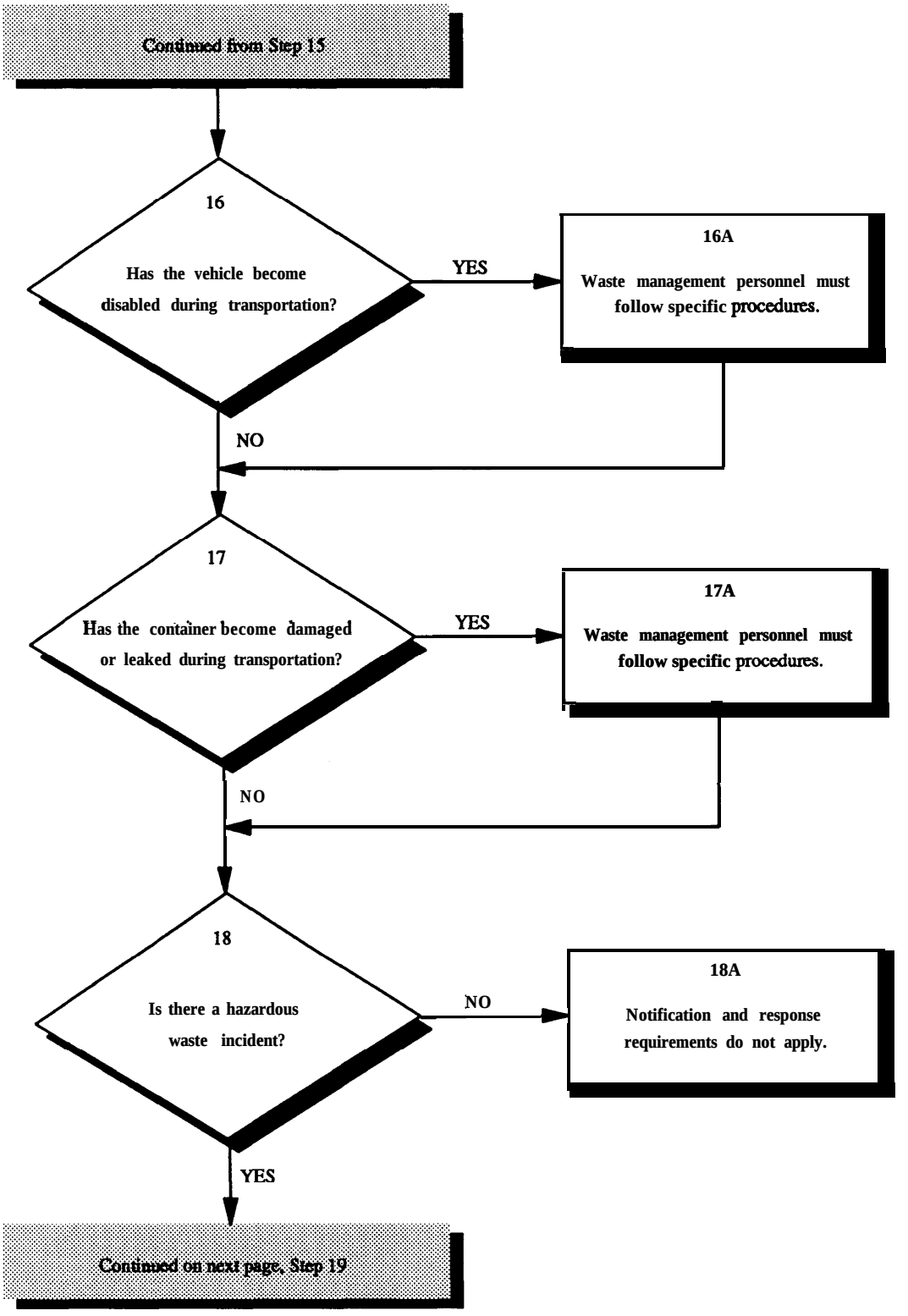
Step 12 Specific requirements apply to the transportation of hazardous wastes on public roads.

Step 12A 49 CFR Parts 174 and 176 detail specific requirements for rail and vessel (i.e., water) transportation. Hazardous waste is forbidden from air transport. When DOE transports a container by rail or vessel, the appropriate regulations should be consulted for additional requirements. In addition, waste management personnel should consult Step 18 within this submodule for additional requirements if there is a hazardous waste incident (i.e., a spill).

Step 13 All shipments of hazardous waste by public highway must be accompanied by a DOT shipping paper. However, a hazardous waste manifest containing all the required shipping paper information may be used as a shipping paper (49 CFR 172.205(h)). The driver of the motor vehicle must ensure that the DOT shipping paper is readily available and identifiable by authorities in the event of an accident or hazardous waste incident. The DOT shipping paper must be clearly distinguished if it is carried with other papers. When the driver is in the vehicle, the DOT shipping paper must be stored so that it is in his immediate reach and either readily visible or in a holder mounted on the inside of the driver's door. When the driver is not in the vehicle, the DOT shipping paper must either be in a holder mounted on the inside of the driver's door or on the driver's seat. 49 CFR Part 177 details specific requirements of carriage of hazardous waste by public highway.

Step 14 All containers must be secured using blocking and bracing techniques against movement within the vehicle on which they are being transported (DOE Order 1540.1 *Materials Transportation and Traffic Management*). Hazardous materials may not be transported on pole trailers. During the loading of the containers, the handbrake must be set, and other precautions (e.g., blocking of wheels), if necessary, should be taken to ensure that the truck does not move during loading. Waste management personnel must not use any loading tools which may damage containers. Waste management personnel must oversee loading and unloading operations. In addition, waste management personnel must not load hazardous wastes together if such loading is prohibited in the loading and storage chart of 49 CFR 177.848. Waste management personnel should also be aware that vehicles with cargo heaters may only be used to transport hazardous wastes if specific requirements (specified in 49 CFR 177.834(l)) are met. In addition to these general loading and unloading requirements, there are specific requirements for the following types of waste: (1) explosives; (2) flammable liquids; (3) flammable solids and oxidizing materials; (4) corrosive liquids; (5) compressed gases; (6) poisons; and (7) radioactive materials. Waste management personnel should consult the appropriate regulations (specified in 49 CFR 177.835 - 177.844) to determine additional requirements.

Step 15 Waste management personnel must transport hazardous materials without unnecessary delay to a facility authorized to receive such wastes. During transportation, records, equipment, and containers must be made available to DOT for inspection and examination. In addition, waste management personnel must comply with all State regulations regarding the transport of hazardous waste through tunnels. Waste management personnel must also maintain an adequate supply of labels and placards so that any missing or unreadable labels or placards may be replaced during transport.


Continued from Step 15
16
Has the vehicle become disabled during transportation?
YES
16A
Waste management personnel must follow specific procedures.
NO
17
Has the container become damaged or leaked during transportation?
YES
17A
Waste management personnel must follow specific procedures.
NO
18
Is there a hazardous waste incident?
NO
18A
Notification and response requirements do not apply.
YES
Continued on next page, Step 19

Step 16 Waste management personnel must follow specific requirements if a vehicle carrying containers of hazardous waste becomes disabled.

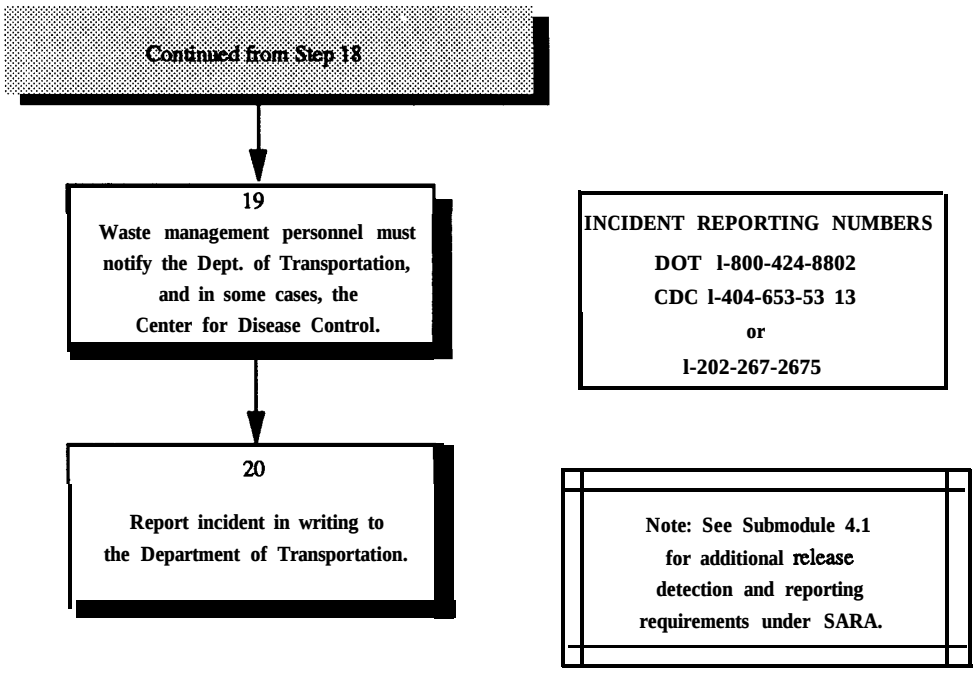
Step 16A If a truck carrying hazardous waste becomes disabled, special care should be taken to remove the vehicle to an area where the load is sufficiently protected from dangers. If necessary, warning devices should be used. The repair and maintenance of vehicles containing hazardous waste is also regulated. No repairs may be made inside a building unless: the cargo area is closed and there is no leakage from the containers; the vehicle can be easily removed in case of an emergency; and the vehicle is removed from the building upon completion of repair or maintenance work. In addition, no repairs should be made with an open flame on a motor vehicle placarded as combustible or on any other vehicle if explosive gases are present the compartment holding the wastes.

Step 17 Specific requirements must be followed if containers are damaged or leak during transportation.

Step 17A If containers are found to be damaged or leaking during transportation, the most practicable of the following three steps should be taken: (1) the container may be repaired and transported to the nearest acceptable disposal place; (2) the hazardous waste may be forwarded to the destination or returned to the shipper using a salvage drum; or (3) the waste may be stored pending proper disposition in the safest and most expeditious manner. In addition to these general incident requirements, the regulations specify action that should be taken during accidents with the following types of waste: (1) explosives; (2) flammable liquids; (3) flammable solids and oxidizing materials; (4) corrosive liquids; (5) compressed gases; (6) poisons; and (7) radioactive materials. Waste management personnel should consult the appropriate regulations (49 CFR 177.855 - 177.861) to determine additional requirements.

Step 18 At the earliest practicable moment, waste management personnel must notify the Department of Transportation when an incident occurs during the course of transportation (including loading, unloading, and temporary storage) that causes one of the following: (1) a person is killed; (2) a person receives injuries requiring hospitalization; (3) property damage exceeds $50,000; (4) the general public is evacuated from one or more hours; (5) one or more major transportation arteries or facilities are shut down for one hour or more; (6) the operational flight pattern or routing of an aircraft is altered; (7) fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive material; (8) fire, breakage, spillage, or suspected contamination occurs involving shipment of etiological materials; or (9) a situation exists that, in the judgement of DOE, should be reported to DOT even though it doesn't meet any of the previous criteria.

Step 18A If none of the criteria outlined in Step 18 are met, then notification and response requirements do not apply.


Continued from Step 18
19
Waste management personnel must notify the Dept. of Transportation, and in some cases, the Center for Disease Control.
INCIDENT REPORTING NUMBERS
DOT l-800-424-8802
CDC l-404-653-53 13
or
l-202-267-2675
20
Report incident in writing to the Department of Transportation.
Note: See Submodule 4.1 for additional release detection and reporting requirements under SARA.

Step 19 Notice should be given to DOT at (800) 424-8802. Notice involving etiological agents may be reported to the Center for Disease Control at either (404) 633-5313 or (202) 267-2675. The notice must include the following information:

- name of reporter;
- name and address of carrier;
- phone number where reporter can be contacted;
- date, time, and location of incident;
- the extent of injuries;
- classification, name, and quantity of hazardous waste involved; and
- type of incident and nature of hazardous waste involvement.

Step 20 Within 30 days of the incident, waste management personnel must report the incident in writing, in duplicate, on DOT Form F 5800.1. If the report pertains to a hazardous waste discharge, waste management personnel must attach a copy of the hazardous waste manifest to the form. In addition, an estimate of the quantity of the waste removed from the scene, the name and address of the facility to which the waste was taken, and the manner of disposition of any removed waste must be indicated in Section IX of the form. The report should be sent to the Information Systems Manager, DHM-63, Research and Special Programs Administration, Department of Transportation, Washington, D.C., 20590-0001. Waste management personnel must retain a copy of the report for two years at the principal place of business of the carrier. If DOT investigates the incident, waste management personnel are required to provide reasonable assistance, including providing access to all records pertaining to the incident.

NOTE: Reporting requirements under the Emergency Planning and Community Right to Know Act (EPCRA) under SARA may also apply. See Submodule 4.1, "Release Detection and Reporting" for more information.

REFERENCES FOR SUBMODULE 3.8

1) *Conduct of Operations Requirements for DOE Facilities*, U.S. Department of Energy, DOE Order 5480.19, July 7, 1990.

2) *Emergency Response Guidebook*, U.S. Department of Transportation, Office of Hazardous Materials Transportation, September 1987.

3) *Materials Transportation and Traffic Management*, U.S. Department of Energy, DOE Order 1540.1, May 1982.

4) *Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes*, U.S. Department of Energy, DOE Order 5480.3, July 9, 1985.

5) 40 CFR Part 263 -- Standards applicable to transporters of hazardous waste.

6) 49 CFR Part 171 -- General information, regulations, and definitions.

7) 49 CFR Part 172 -- Hazardous materials table.

8) 49 CFR Part 173 -- General requirements for shipments and packagings.

9) 49 CFR Part 178 -- Specifications for packagings.

10) 49 CFR Part 179 -- Specification for tank cars.